

NEW SERIES.]

DECEMBER AND JANUARY.

[VOL. 1, NOS. 6-7.

OUT WEST

A MONTHLY MAGAZINE

OF

ORIGINAL AND SELECTED ARTICLES,

BEARING PRINCIPALLY ON THE

ROCKY MOUNTAIN SECTION,

WITH A SUMMARY OF NEWS.

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"OUT WEST" PRINTING AND PUBLISHING COMPANY.

PROSPECTUS.

OUR WEST aims to be the Magazine of the *Rocky Mountain Section*, and of Colorado especially, as its prominent representative.

Nature has marked out this Section by many peculiarities (geographical, topographical, climatic, etc.,) as a distinct one, and it seems appropriate that it should have a magazine distinctly its own.

For such a publication it will yield abundant topics of interest, for it is a wide field in which to reap, and (to the rest of the world) comparatively an unknown one.

Its physical characteristics alone—its Peaks and Parks and Passes, its Glens and Cañons, its Groves and Forests, its Lakes and Streams and Waterfalls, its Table-lands and its Valleys, its sweeping Plains—might furnish themes for almost endless description.

The researches of topographers, geologists, mineralogists, botanists, and other scientists, are daily unfolding new wonders, the full record of which would require many volumes.

The deeds of daring, the privations and the sufferings of Pioneers in the not far distant Past; the customs and the folklore of the red men who have so long held this vast region for their own, but who are so rapidly disappearing before the on-coming flood of Civilization; the struggles between the old inhabitants and the new; these and kindred subjects can furnish many a thrilling and romantic chapter.

The evidences of an ancient civilization—though scanty as yet—give promise that ere long, the history of a still older race will await the chronicler.

These subjects it is intended shall all find a place, from time to time, in the pages of **OUR WEST**.

The Past, however must, to a great extent, give way to the Present.

The white man has come to take the place of the red man, and is stamping the superscription of his kingship on the face of the land. The scream of his locomotive wakes the echoes which a while ago multiplied the war-whoops of the savage. He has turned the fruitful waters upon the Valleys and Plains over which the Indian so lately hunted and fought, and has made their barren wastes to "smile with fields of wavy corn." He has built Churches and Schools and Business Blocks where, but a few years since, the squaws put up the wigwags for their braves. His sheep and cattle are feeding on the range of the antelope and the buffalo. His mining camps are driving the bear and the panther from their lairs in the mountains. And day by day the old order of things is giving place more and more to the new; the Stone has been thrown into the water, and the circles are spreading outwards with continually widening reach.

To present a reflex of this progress of Civilization in its various branches, will be a chief part of our purpose, and to help it forward, to some extent, will not be beyond our ambition.

In brief, it will be sought to make **OUR WEST** such that anyone reading it will gain a full and accurate idea of the Rocky Mountain Section in all its phases—its geography, topography, scenery and climate, its resources, its capabilities, and its wants, its industries and enterprises, its associations and prospects.

To this end, the Editor has already secured the assistance of several contributors, who are prominently identified with the Rocky Mountain Section, and who are eminently fitted, by experience or study, to furnish contributions of interest and value. He trusts that many others, similarly qualified, will be induced to give their aid, and he commends the enterprise to their good will.

Free use will be made of articles of value appearing in other publications, and these Selected Articles, thus brought together from various sources, will, it is believed, be one of the most valuable features of the Magazine.

A short Summary of News will also be published each month. In this, the aim will not be to present a complete chronicle of events, but rather to give a selection of such items of news as will be a fair index of what is going on.

Whilst **OUR WEST** has been made sufficiently large to afford ample space for these various features, it has been thought well to keep it, for the present, within comparatively narrow limits, it being preferable that it should "grow up with the country" rather than that it should start out on too ambitious a scale, only to afford one more example of the rule that "pride goes before a fall."

J. E. LILLER, Editor.

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OUT WEST.

NEW SERIES.] DECEMBER & JANUARY, 1873-4. [Vol. 1, Nos. 6-7.

LONG'S PEAK.

On Monday, Sept. 29, 1873, I left Evans' Ranch, Estes' Park, to ascend this mountain, the most imposing of the Rocky Range. The party consisted of two gentlemen from the East, myself, and Mr. Nugent, (better known as "Rocky Mountain Jim") as guide; and a better, kinder, more thoroughly competent, considerate, and cautious guide could not be found. We did not take up a pack-animal, but carried our camping blankets and provisions for three days on our saddles.

The four hours' ride to the camping ground was one series of glories and surprises, of park and glade, of lake and stream, of mountain on mountain, all culminating in the riven top of Long's Peak, which grew grander and more ghastly as we rose to a height of 11,000 feet. The slanting sun added new beauty every hour,—black pines against a lemon sky, gray peaks reddening in the light, gorges of deep and infinite blue, floods of golden glory, an atmosphere of crystalline purity, a foreground constantly of the cottonwood and aspen flaunting in red and gold, deepening the blue gloom of the pines, the trickle and murmur of streams fringed with icicles, the strange, weird sound of gusts moving through the pine-tops—sights and sounds, not of the lower earth, but of the storm-riven, beast-haunted, frozen upper altitudes. Nothing so wonderful and vast in scenery ever met my eyes; its individuality and beauty are altogether unrivalled.

On, over the dry, buff grass of Estes' Park—the peerless gem of the Rocky Mountains; turning off up a narrow track on the side of a pine-hung gorge, up a steep, pine-clad hill, down to a small valley rich in long grass and enclosed by lofty mountains, whose deepest hollow contains a

lily-covered lake, fitly named the Lake of the Lilies. The view here is enough to make an artist faint from its beauty. Vainly one tries to drink it in and make it one's own forever.

From this, we ascended into the dark purple gloom of a vast pine wood, from whose chill and solitary depths we caught wonderful glimpses of golden glory and rose-lighted summits, not of "the land very far off," but of the land near now in all its grandeur, gaining in sublimity by proximity—glimpses, too, through a long broken vista of purple gorges, of the illimitable Plains, all idealized in a flood of sunlight rolling over them like a sunset sea in waves of misty gold.

We rode through the gloom on a steep trail blazed through the forest, all one's intellect concentrated on avoiding being dragged off by impending branches, or having the blankets torn to pieces by sharp dead limbs, between which there was hardly room to pass—the horses breathless, requiring to stop every few yards, though their riders, save myself, were afoot. The gloom of the dense, silent, ancient forest is to me awe-inspiring. It is so soundless, save for the branches creaking in the wind, the occasional snap of decayed timber, and the murmur in the pine-tops as of a not distant waterfall, all tending to produce a "sadness not akin to pain," an eeriness only distantly related to fear.

The trees grew smaller and more sparse as we ascended, and had a rugged, tortured, warring look, until the timber-line was passed. But, a little higher, a slope of mountain meadow dipped to the south-west, towards a bright stream forcing its way through ice and icicles, and there a grove of the beautiful balsam pine marked our camping ground. The trees were in miniature, but so exquisitely arranged that one might well

ask what artist's hand had planted them, scattering them here, clumping them there, and training their slim spires towards Heaven.

Looking East, gorges opened to the far-distant Plains, then deepening into purple gray. Mountains, mantled with dark pines, rose in ranges, or solitary, uplifted their bald, gray peaks; while, close behind and nearly 4,000 feet above us, rose the splintered summit of Long's Peak, snow here and there upon its rugged wall, and its huge precipices red with the light of a sun lost already to our vision. Close to us, in the caverned side of the mountain, was snow that, owing to its position, is eternal, forming the frigid, ghastly back-ground of the scene.

While I was lazily admiring, "Mountain Jim" was building a great pine-log fire, making tea and coffee, and arranging thoughtfully for every one's comfort. After the meal, songs were sung, and "Jim" recited a piece of poetry of his own composition, which was so creditable that I hope it will soon appear in print.

Some artists who had been up there lately had woven and interlaced the lower branches of a grove of beautiful miniature pines so as to form a bower, at once affording shelter from the wind and an agreeable privacy. This, thickly strewn with young pine shoots, was my apartment, and, with plenty of blankets, and an inverted saddle for a pillow, I had a luxurious bed and was entirely insensible to cold, though the mercury was several degrees below the freezing point. But it was not easy to sleep when shivering stars looked through the fragrant canopy, when for bed-posts one had living pines, for curtains their interlaced boughs, and for night-lamp the ruddy glare of a camp-fire.

The dawn seemed so long before sunrise, so lemon-colored, so pure; and the sunrise itself was a never-to-be-forgotten sight. From the chill grey peak above, from the everlasting snows, from the silvered pines—down, through mountain ranges with their depths of Tyrian purple, we looked to where the Plains lay cold in blue-gray, like a morning sea against the verge of the far horizon. The sun rose above the cold gray line, a dazzling streak at first, then an enlarging portion of a sphere, a light and glory as when it first

appeared in the firmament. I felt as if, like a Parsee, I must fall down and worship. The gray of the Plains changed to purple, the sky was all one crimson flush on which vermilion cloud-streaks rested, the ghastly peaks gleamed like rubies, the earth and heavens were new created. For a full hour those Plains simulated the ocean, down to whose limitless expanse of purple, cliffs and rocks and promontories swept down.

At seven, we struck camp and passed into the ghostlier solitudes above, I riding as far as what, rightly or wrongly, is called the "Lava Beds," an expanse of large and small boulders, with snow in the crevices. When we arrived at the "Notch," a literal gate of rock, I found we were absolutely on the knife-like ridge or back-bone of Long's Peak, only a few feet wide, broken, rugged, covered with Titanic fragments, and, on the other side, shelving in one precipitous, snow-patched sweep of two or three thousand feet to a picturesque ravine, containing a lake of pure, green water, and further off, other lakes hidden among dense pine woods, while close above us rose the Peak, gaunt, riven, snow-slashed.

Passing through the "Notch," we looked along the inaccessible side of the Peak, composed of boulders and *debris* of all shapes and sizes, through which appeared broad, smooth ribs of reddish-colored granite, looking as if they upheld the towering rock-mass above. I usually dislike bird's-eye and panoramic views; but, though from a mountain, this view was not such an one. Serrated ridges, not much lower than the one on which we stood, rose one beyond another, far as that pure atmosphere could carry the eye, broken into awful chasms deep with ice and snow, rising into peaks and pinnacles piercing the heavenly blue with their cold, barren gray—on, on forever, till the most distant range upbore unsullied snow alone. Deep fair lakes mirroring the dark pine woods, cañons, dark and blue-black with unbroken expanses of pines, snow-slashed pinnacles, wintry heights frowning upon lovely parks, watered and wooded, lying in the lap of Summer, North Park floating off in the blue distance, Middle Park closed till another Summer, the sunny slopes of Estes' Park, and, winding down among the mountains, the snowy ridge of the Divide, whose bright waters seek the Atlan-

tic and Pacific Oceans. There, far below, links of diamonds showed where the Grand River takes its rise to seek the mysterious Colorado, with its ever unsolved enigma, to lose itself in the still waters of the Pacific; and nearer, the snow-born Thompson burst forth from the mountains to begin its journey to the Gulf of Mexico. Grandeur, picturesqueness, solitude, sublimity, beauty, all uplifted above the lower world. Nature, rioting in her grandest mood, exclaiming: "Lord, what is man that Thou art mindful of him, or the Son of man that Thou visitest him?"

Here the real business of the ascent begins, and it would not be easy to over-estimate its difficulty and fatigue. Two thousand feet of solid rock towered above us; two thousand feet of broken rock shelved precipitous below; smooth granite ribs with hardly foot-hold stood out here and there; melted snow, re-frozen several times, presented a more serious obstacle; many of the rocks were loose and tumbled down the slope when touched; and to me it was four hours of extreme terror. Indeed, I never should have gone half way, had not "Jim," *nolens volens*, dragged me along with a patience and skill, and withal a determination that I should ascend the Peak, which never failed. After what seemed to me an exhausting amount of toil, we reached the real heavy grade of the ascent, a long gulch with inaccessible sides. This was partly filled with ice and snow, and partly with large and small fragments of rock which are constantly giving way, rendering the footing very insecure. Slipping, faltering, trembling, from the hard toil in the rarefied air; with throbbing hearts and bursting lungs, we reached the top of the gorge, where a difficult climb between some gigantic fragments of rock introduced us, by an abrupt turn, round the south-west angle of the Peak, to a narrow shelf several hundred feet long, rugged, uneven, and so overhung by the cliff in some places, that it is necessary to crouch to pass at all. Above, the Peak is nearly vertical for about 500 feet, and below, a tremendous precipice descends in one unbroken fall. This is usually considered the most dangerous part of the ascent, but it does not seem so to me, for such foot-hold as there is, is secure, and it is generally possible to hold on with the hands. But here and on the final, and

as I think, the worst part of the ascent, one slip and a breathing, thinking human being, would lie a shapeless, bloody heap, 3,000 feet below. "Jim's" noble dog, an animal almost human in its intelligence, refused to traverse this shelf, and remained behind at the "Lift," howling pitcously.

From hence, the view, though different, is as magnificent as that from the Notch. At the foot of the stupendous precipice lay a lovely lake, wood-embosomed, from or near which the bright St. Vrain takes its rise. Snowy ranges, one behind another, extended to the distant horizon, folding in their wintry embrace the beauties of Middle Park. Pike's Peak, more than 100 miles away, lifted that vast but shapeless summit, which makes it the land-mark of Southern Colorado. Giants everywhere reared their lonely splintered summits. There were snow-patches, snow-slashes, snow-abysses, snow forlorn and soiled looking, snow pure and glistening, snow dazzling above the purple robe of pines worn by all the mountains, while away to the East in limitless breadth stretched the green-gray of the endless Plains. From hence with a single sweep the eye takes in a distance of 300 miles—that distance to the West, North and South, being made up of mountains, ten, eleven, twelve, thirteen thousand feet in height, dominated by Long's Peak, Pike's Peak, Gray's Peak, all nearly the height of Mt. Blanc! On the Plains, we traced the rivers by their fringe of cottonwoods to the distant Platte, and, between us and them, lay glories of mountain, cañon, and lake, sleeping in depths of blue and purple most ravishing to the eye.

I was anxious to remain here, for my strength was gone, and I was detaining the rest of the party, but our guide did not allow me to exercise any will of my own, and I was dragged on.

The worst was yet to come. As we crept from the Ledge round a horn of rock, I beheld what made me perfectly dizzy to look at—the terminal Peak itself, a smooth, cracked face or wall of pink granite, as nearly perpendicular as anything could be, up which it was possible to climb, well deserving the name of the "American Matterhorn." *Scaling*, not climbing, is the correct term for this last ascent. It took one hour to ascend that 500 feet, stopping every four

or five steps to get breath. The only foothold was in narrow cracks, or on minute projections on the granite. To get a toe in these cracks, and on hands and knees to crawl, to be dragged up by main force, to get hold here and there on a scarcely obvious projection, all the while gasping and struggling for breath, and tortured by thirst—this was the climb; but at last the Peak was won.

A grand, well-defined mountain-top it is—two or three acres of boulders, nearly level, with precipitous sides all round, the one we came up being the only accessible one.

Here were seen, in one unrivalled combination, all the views which had rejoiced our eyes during the ascent. It was something, at last, to rest upon the storm-rent crown of this lonely sentinel of the Rocky Range, on one of the mightiest of the vertebrae of the backbone

of this vast continent, and to see the waters start for both oceans. Uplifted beyond war, and hate, and storms of passion; calm amidst the eternal silence; fanned by zephyrs, and bathed in living blue, Peace seemed to rest upon the Peak, as if it were indeed that region

"Where falls not rain, or hail, or any snow,
Or ever wind blows loudly."

We placed our names, with the date of ascent, in a tin within a cairn, and afterwards accomplished the slippery and perilous descent in safety, remaining that night at the camping ground owing to excessive fatigue, and reaching Evans' delightful ranch, in Estes' Park, at noon of the following day. A more successful ascent of the Peak was never made, and I would not now exchange my memories of its perfect beauty and extraordinary sublimity for any other experience of mountaineering in any part of the world.

ISABELLA L. BIRD.

THE DISCOVERER OF PIKE'S PEAK.

His name was Zebulon Montgomery Pike; a native of New Jersey; his father an officer of the Revolutionary army, who was retained in service after the war, and took part in the bloody wars against the Indians in President Washington's time. The father was also named Zebulon; and the son appears to have been a chip of the old block in more respect than similarity of name. At the age of twenty, young Pike was appointed an Ensign in his father's own company, and in six years attained the rank of Lieutenant, which he held on the day that he first beheld the Peak which will transmit his name to the latest posterity.

In the summer of 1805, Lieutenant Pike was at his post in the Western country under command of General Wilkinson, and then it was that he began his brief career as an explorer.

One of the most marked traits in the character of President Jefferson was the great interest he took in extending the boundaries of knowledge; particularly of this continent; and, although he could not promote this object at the public expense, yet he availed himself of every opportunity to do so incidentally. General Wilkinson,

knowing the curiosity of the President, and being desirous of opening relations with Indians of the upper Mississippi, detached Lieutenant Pike on this errand in August, 1805, and availed himself of the chance to have the sources of the Mississippi ascertained; for at that period, as Lieutenant Pike remarks, the regions West of the Mississippi, both North and South, were "little more known to mankind than the wilds of Africa."

On Friday afternoon, August 9, 1805, in a keel-boat seventy feet long, provisioned for four months, and manned by one sergeant, two corporals and seventeen privates, Lieutenant Pike started from his encampment near Saint Louis. He was then twenty-six years of age, abounding in health and vigor, a martinet in discipline, and most ambitious to accomplish the object of his expedition. Indeed, his fault as an explorer was an excess of energy. He was too precipitate. He wore out his horses, his men, and himself, by attempting to do in one month what could be done much better in three months. Nor was he acquainted, like Lewis and Clark, with those arts of the frontier, that lore of the red man and hunter, which enables men to subsist comfortably in

the wilderness, and to come home after a year's tramp in much better condition than when they started.

Up the Mississippi he sailed, and reached the lead mines in a month, where he met a gentleman whom we all at once recognize—"Monsieur Dubuque"—who was getting out thirty thousand pounds of lead per annum. In six weeks he was at the falls of St. Anthony, around which he carried the canoes which he had substituted for his large boat; and, pushing on through cold and snow and storm, was obliged at length to change his canoes for sleds, which were drawn by his own men. He had far better gone into winter quarters, as the reader may see by a single entry in his journal, for December 23d:

"Never did I undergo more fatigue, in performing the duties of hunter, spy, guide, and commanding officer. Sometimes in front, sometimes in the rear, of my party; so that at night I could hardly make my notes intelligible. Killed two racoons. From our sleds breaking down, and having to make so many portages on the road, made but four miles."

On he went, however. He celebrated Christmas by giving out to each man "two pounds of extra meat, two pounds of extra flour, one gill of whisky, and tobacco." On some days in January the cold was so intense that he was obliged to send men ahead to make a fire every three miles, and, notwithstanding this precaution, there were many frozen toes, fingers, and noses in the company. January 31, 1806, he reached the utmost source of the Mississippi River, where he was generously entertained at an establishment of the North-west Fur Company.

After exploring round about for eighteen days, he started on his return. Seven weeks' travel brought him again to Saint Louis, which he reached April 30, 1806, after an absence of eight months and twenty-two days.

Married man as he was, and tenderly attached to his wife, he was only allowed ten weeks of repose; for General Wilkinson had been so happy as to find a very good pretext for another exploring expedition. He had some Osage captives to send up the Missouri, and it was advisable to notify the Indians in the valley of the Arkansas

that their country had changed masters. But the real purpose of the new expedition was to gain a little knowledge of the interior of that unknown "Louisiana," which the Government had just purchased of Napoleon for fifteen millions of dollars.

On this occasion the party consisted of Lieutenant Pike, commander, another lieutenant, one surgeon, one sergeant, two corporals, sixteen privates, and an interpreter. They had in charge fifty-one Indians—chiefs who had been to Washington, captives, squaws, and children—who were to be returned to their village near the Missouri.

Leaving the neighborhood of Saint Louis, July 15, 1806, in two boats, he sailed up the Missouri for six weeks, when he landed his Indians, left his boats, bought fifteen horses, loaded them with stores and presents, and struck Southward for the Arkansas River. In two months he had reached that stream, and happy would it have been for him and his party if he had encamped there for the winter. But he was not an encamping man. Pushing on, a few days brought him to where herds of buffaloes blackened the prairie. On Saturday, November 15, 1806, an event occurred which he thus relates:

"At two o'clock in the afternoon, I thought I could distinguish a mountain to our right, which appeared like a small, blue cloud; viewed it with a spy-glass, and was still more confirmed in my conjecture, yet only communicated it to Doctor Robinson, who was in front with me; but in half-an-hour they appeared in full view before us, and when our small party arrived on the hill, they with one accord gave 'Three cheers for the Mexican mountain!'"

This mountain, that looked like a small, blue cloud, was the Peak which now bears his name. They had to march a full week before they reached the nearest mountain of the range; which, with incredible difficulty, they ascended, and from the top they beheld the Grand Peak, covered with snow, at the distance of sixteen miles. If it had been a possible thing, he would have ascended that peak also. But, as the soldiers had no winter clothes, and had entirely worn out their stockings, and as the Peak appeared inaccessible, he reluctantly continued his journey,

without attempting the ascent. Nor did he give it the name it now bears.

And now the winter rushed down from these mountains on this little party. Snow a foot deep covered the Plains. Sometimes they met with no game for days together, and had nothing to eat. The horses, that could only get a little grass by pawing for it, and whose raw backs were torn by maggots which they could not shake off, gave out one after the other. Some nights it was so cold that they dare not go to sleep, and one night nine men had their feet frozen. There was one occasion when, for four days, no member of the little party ate a morsel; and even the indomitable commander was so giddy from fasting that he could scarcely stand. Even then, he was a martinet in discipline. He thought, because he bore two men's share of toil and hardship, that no other man had a right to complain. One day a soldier, for the first time, uttered a complaint, saying, as he trudged wearily along, through the deep snow:

"It is more than human nature can bear, to march three days without sustenance, through snows three feet deep, and carry burdens only fit for horses."

The Lieutenant said nothing at the time; but in the evening, when he had the luck to shoot a buffalo, and all the party had been regaled with meat, he had the soldier brought into the midst of the company, and addressed to him the following terrific speech:

"Brown! you this day presumed to make use of language which was seditious. I then passed it over, pitying your situation, and attributing it to your distress, rather than to your inclination to show discontent among the party. Had I reserved provisions for ourselves, (the officers,) while you were starving; had we been marching along light and at our ease while you were weighed down with your burden, then you would have had a pretext for your observations. But when we were equally hungry, weary, emaciated, and charged with burdens which I believe my natural strength was less able to bear than any man's in the party—when we were always foremost in breaking the road, in reconnoitering, and in the fatigues of the chase—it was the height of ingratitude in you to let an expression escape which

was indicative of discontent. Your language, for this time, I will pardon, but I assure you, should it ever be repeated, by instant death I will revenge your ingratitude and punish your disobedience."

At the same time he thanked the soldiers for the fortitude they had shown, and promised to do all in his power to secure to them a reward from government, and the thanks of their countrymen.

The men whose feet were frozen, he was obliged to leave in a camp, with a supply of food and ammunition. With the strongest of the party he pushed on through the snows, until January 30th, he reached a river which he supposed to be the Red, one of the objects he had been especially charged to explore. Here he made a stockade, intending to gather and restore his men, and float down the Red River in canoes. The stream, however, proved to be the Rio Del Norte. Unwittingly he had violated Spanish territory, and he and his party were arrested and conducted to the Spanish post of San Antonio, in Texas. Upon explaining his objects, however, and showing his papers, he was hospitably entertained, and taken on his way to the nearest American post, Natchitoches, which he reached July 1st, 1807, and where he was joyfully received by the officers.

"Language," says the Lieutenant, "cannot express the gaiety of my heart when I once more beheld the standard of my country waved aloft."

He and his company received thanks and rewards from Congress. He was promoted three grades in three years, and soon after the war of 1812 broke out, he was promoted to the rank of brigadier-general. In 1813, at the head of seventeen hundred men, he assaulted the British post on the site now called Toronto. Landing under a heavy fire from the fleet, he carried one battery, and was about to advance on the main work, when the British magazine exploded, and General Pike was mortally wounded by a heavy stone. He was carried, dying, to the commodore's ship. As he was breathing his last, the captured British flag was shown to him. He made a sign to place it under his head, and while doing so expired.

JAMES PARTON.

THE CONIFERÆ OF THE ROCKY MOUNTAINS.

As we enter the Rocky Mountains by way of Golden City, the first Pine that attracts our attention is the Heavy-wooded Pine of the Pacific Coast, the *Pinus ponderosa*. It is, however, so different, in its general aspect, from the same species growing in the far West, that I could hardly recognize it on a first acquaintance. The leaves are not as long, and the cones smaller, while the tree itself doesn't reach the same large proportions. I noticed a stump in Williams' Cañon, near Pike's Peak, in 1873, which was about nine feet in circumference, and this, I think, is as large as the Rocky Mountains produce. This stump gave two hundred and sixteen annual rings, which is no great age for trees in comparison with the age of trees in other parts of the world. Of the several species which I have found in the Rocky Mountains, this one is, I think, most generally distributed. Other species seem confined to special tracts; but generally this variety, though having special tracts of its own, is more frequently mixed with the others than any other species. The Heavy-wooded Pine gives a very picturesque and Park-like appearance to many of the choicest parts of the Rocky Mountain scenery. Along the Southern boundary of the plateau known as South Park, and going towards Pike's Peak, the heavy and yet flowing, somewhat pendulous, branches of this Pine, in striking contrast with its round head, give a peculiar character to this line of travel. The inner bark is a favorite article of food with the Utes, and, in some places, large numbers of trees have been peeled up as high as the arms can reach. The timber is very heavy, and on this account it has received its name. In many places it is covered with a small, parasitic plant, allied to the Mistletoe of Europe, called by Botanists, *Arceuthobium*.

Going by the route above suggested, the next Pine we meet is the *Pinus Contorta*, which may be readily distinguished by the ordinary traveler through its light green foliage, and generally slender, straight stems. It also is a native of the North-west coast, where it is said to favor low ground. In Colorado, however, it seems to

thrive in the high, rocky places as well as any of them. Although it often attains fifty feet in height, the trunk is never more than a foot in diameter, so far as I have seen. In traveling through the mountains, it often disappears for days together, and then becomes very abundant again. It abounds in the Clear Creek region, and especially above Georgetown. It is a remarkable fact that there are few young forests of Pines coming on to take the place of the older ones in any of the sections I have visited. Wherever I have seen any, they have been mostly of this species. Sometimes a whole mountain slope will be covered with young ten or fifteen year old trees, looking in the long distance like fields of grain. On this pine another species of parasite, *Arceuthobium Americanum*, exists. In my excursion in 1871, I was fortunate enough to find the female form of this species, which had never been known to botanists till my discovery. This pine was called *Pinus Contorta*, from the twisted way in which the branches seem to grow. The trees seen in South Park, however, do not by any means suggest this, and some botanists who have seen the trees only in the vicinity of Denver, have doubted the appropriateness of the name; but in the line of Boulder Creek, this character is very well noted. The tree is often liable to produce fasciated branches, looking like large crows' nests, and the contorted character of the branches, no doubt, may be traced to the same influence.

Near Pike's Peak we come on low bushes of the Piñon, *Pinus Edulis*. This is, perhaps, the most northern range of this species. As we travel towards Pueblo, it is quite common. It forms a low bush, rather than a tree, but the trunk is quite thick for the height, and is very popular as fire-wood with the ranchmen.

Here and there through the South Park, we meet a tree of *Pinus Flexilis*, the American Cembran Pine, which is the representative, on this continent, of the Swiss Stone or Cembran Pine—*P. Cembra*. It does not seem very abundant in any place I have visited, except about the Caribou Silver Mines, where it is the only

true Pine, and tolerably abundant. These were very much broken and deformed by the immense masses of snow which, at that high elevation, cover them in the winter season.

Crossing the South Park, towards Fairplay, we come to occasional clumps of *Pinus Balfouriana*, or *P. Axistata*, as it has been called by some American Botanists. It may be readily distinguished by the flattish top of the trees, caused, apparently, by the central branches ceasing to grow vigorously, and the lower ones seeming to press stronger to catch up with them. These long branches have few branchlets, but they have a very ropy bark. On the ascent to Gray's Peak, from Bakersville, they are very abundant as we approach the timber-line. It does not make much of a trunk, and I suppose is valueless as a timber tree. The cones, however, are among the most beautiful to examine of all the true Pines of this region.

Of the Spruces there are three, all of them valuable as timber trees.

Abies Mensiesii is among the first to catch our eye, from its peculiar grey tint, and generally narrow dimensions. I have seen hundreds of trees which were, perhaps, fifty or sixty feet high, but the branches of which extended not more than six or eight feet from the trunk; and when they run eighty or one hundred feet high, in the most favorable circumstances, they scarcely extend more than ten or twelve. The diameter of the best specimens is about $2\frac{1}{2}$ to 3 feet, but $1\frac{1}{2}$ to 2 feet is the general size. The branches are very thickly studded with the bases of the leaves, which fact makes the trees very hard to climb. The leaves are also very sharp at the points.

Abies Douglassii, the Douglass Spruce, grows in company with it. They seem to be almost inseparable companions—if we find one, we are not long in meeting with the other. The Douglass Spruce grows to about the same height and dimensions as the Mensies. The leaves are not as sharp, nor of the grey tint of the other, and the branches spread wider. They are also readily distinguished by the leaves.

But the Prince of the Spruces is the *Abies Englemannii*. This approaches the Norway

Spruce of Europe in its rich texture and way of growing, and equals it in height and dimensions of the trunk, while the foliage is of the most beautiful silvery blue it is possible to conceive. It is very abundant on the ascent to Gray's Peak, and is the highest, forming the timber-line. It is also in some quantity about Caribou, and will most likely be found more abundant northwardly, as that region becomes explored.

There is but one Fir in this region, the *Picea Grandis*, or Grand Fir. This I first saw in Engleman's Cañon, in 1871; but since then I have seen it scattered in various parts of the mountains. It never seems to make forests of its own kind, but is mixed with others. Up Clear Creek Cañon it is not unfrequent, and in the woods about Gray's Peak, it is not uncommon. It is easily discerned among all other Rocky Mountain Coniferæ by its silvery, smooth stem. There is much variation in the character of the trees in different places. Some have white cones, and again we see trees with purplish ones. English botanists have endeavored to make several species of them, but there is but one.

Among the Coniferæ, we must not forget the Cedars. The Eastern species, *Juniperus Virginiana*, and the Western, *J. Occidentalis*, seem to meet here and grow together. The Western is the lower and sturdier; the berries are larger, and the branches more coarsely intersected by the oppressed leaves. The Eastern, or Red Cedar is very variable in the Eastern States, and is so here.

Perhaps we may include in the Coniferæ of the Rocky Mountains, the Fossil Forest at Castello's Rancho. In 1871, when I visited it, one trunk was *thirty-six feet* in circumference, but a barbarous wretch, with his unfortunate wife and mule-team, was then splitting it up to haul away hundreds of miles to sell on speculation as curiosities. I believe this old forest to be of Redwood, the same as now exists in California.

Philadelphia.

THOMAS MEEHAN.

SAN JUAN.

HISTORY.

The extreme Southwestern portion of Colorado,—a part of which, known as "The San Juan Country," is now the theme in almost every mouth in the Territory, and is awakening interest and attracting attention far beyond its borders—has been little known to the general public until within a very recent date. Government exploring expeditions have passed around and beyond it, but have seen very little of it. Spanish and Mexican adventurers and explorers occasionally traversed its outskirts, but acquired no accurate knowledge of it.

For years, however, the belief has prevailed throughout New Mexico that gold and silver mines of inexhaustible richness existed somewhere in this unexplored country. Navajoes and other Indians frequently exhibited ornaments and bullets of solid gold, asserting that they had obtained the precious metal in this unknown region, and described the lodes and veins as being exposed upon the sides of the mountains, the dazzling glitter of the precious metal being plainly visible to the casual passer-by. Although the untrustworthiness of the Indian character was well understood, credence was given to the stories, and a sort of tradition was established that, in the country of the Indians, was a Golconda whose wonderful mines far exceeded in richness anything which had been discovered elsewhere on the North American Continent.

Repeated efforts were made, on the part of white men, to discover the exact locality whence these remarkable nuggets and more remarkable stories came; but in vain. The wily Navajoes repeatedly promised, for suitable bribes, to lead the tantalized prospectors to the alluring spot, but, so soon as the bribes were secured, they deluded their dupes into arduous journeys over the highest mountains and through the most difficult cañons, and, at the end, failed to show them anything of importance. Maxwell, formerly the proprietor of the great "Maxwell Grant," was the heaviest and most frequent loser by these swarthy swindlers. Always noted for his admiration of fine and fast horses, and

keeping about him, at all times, a large and valuable stud, he was over and over again beguiled by the wily chiefs to give them some of his favorites on their sworn promises that "this time" they would certainly reveal to him the wonderful locality; but just as frequently did the parties sent with the lying red-skins return completely worn out, and with not so much as a piece of promising blossom-rock to reward their toilings.

In 1860, a party of plucky Americans, not quite disheartened by the disappointment of the then recent Pike's Peak search and failure, set out—led by that veteran mountaineer, Baker—resolved on discovering this fabled treasure-spot of the Rocky Mountains. They entered the Northwestern part of what is now the Territory of New Mexico, and proceeded up the San Juan Valley by way of the Tierra Amarilla and the Pagosa Hot Springs. As there were no practical lode-miners in the party, their sole object, of course, was the discovery of placer diggings. Some of them penetrated as far as the head of the Rio Grande Del Norte, but the main body got no farther than the head-waters of the Animas River. There, the inevitable instinct of the adventurous American caused them to lay out a City, which they designated "Animas City," after the name of an imaginary Park of enormous dimensions, said to lie to the northward of the selected City site. To this day, maps of the district show the surmises of the draughtsmen as to the locality of the "City" and the "Park." The party prospected along numerous tributaries of the Animas, and in the vicinity of a small but beautiful Park, which was named, in honor of their leader, Baker's Park, a name it still bears. Some placer diggings were found, but the results did not come up to their exaggerated expectations, and this fact, coupled with the rapid disappearance of their provisions, caused discouragement and an eager search for a nearer route from the spot than that by which they had come. They scattered in all directions through the mountains at and about the head of the Animas, and many perished from starvation; the survivors suffering

a thousand deaths from cold and privation ere they found egress. Gold was discovered in all the streams, but not in large quantities. Garnets and rubies, and other precious stones were picked up, but none of great value.

Their short stay in the region would not, at the present time, cause their report to be received as final, in any sense, but on the whole it was so discouraging that the hardiest mountaineers hesitated for years before venturing into the district.

Poor Baker, the leader of the party, the survivor of scores of hair-breadth escapes from savage men and savage elements, lived to organize an expedition for the purpose of exploring the Grand Cañon of the Colorado, when he was brutally murdered at the outset. White, his partner, and the sole survivor of the mad attempt, reached the mouth of the Cañon after days of agony such as pen cannot even faintly portray. At starting, he was a man in the prime of life; when rescued below the Cañon, he was insensible, his hair bleached as white as the driven snow, and his hands and feet completely blistered and fly-blown. He had devoured his leathern belt, his shoes, and the buckskin pouch in which he carried his provisions.

Adam Augustine and David McShane, now residents of Monument Valley, El Paso County, were prominent figures in the Baker San Juan expedition; Charlie Jones, of Gilpin County, also survived the privations and toils of the trip; as also did Charles Hall, now living quietly at the Salt Works, in South Park. Each of these can relate experiences that belong to the domain of wildest romance.

Other parties visited the San Juan Region the same season. D. C. Collier, now of Central City, published a most enthusiastic account of his trip in the *Rocky Mountain News*, and, as the result of his observations, expressed readiness to stake his reputation as a journalist and geologist on the prediction that, within fifty or a hundred miles of the head-waters of the Rio Animas, would be found the richest and most extensive diamond-fields in the world.

Within the past four years, parties from New Mexico and Colorado have prospected the country more carefully, and with better results than

those already chronicled. Abandoning the idea of rich placer diggings, they turned their attention to lode-hunting.

In 1869, Ex-Governor Pile, of New Mexico, fitted out a party of experienced lode-prospectors at Santa Fe, to explore the head-waters of the San Juan and contiguous streams. The party spent the season without finding any remarkable mineral deposits, but they found evidence of the existence of such sufficiently strong to induce them to return another season.

In 1870, they pushed their explorations farther to the westward, and passed up the Rio Animas to the vicinity of Baker's Park, where they at once saw unmistakable signs of rich lode-deposits of the precious metals. Later in the season they were rewarded by finding the "Little Giant" gold lode. The samples from this were so unlike anything yet brought to light that they were urged to forward a considerable quantity to New York, for test. The results were a surprise to all parties, the samples yielding all the way from \$900 to \$4,400 per ton.

The peculiarities of this lode were: its exposed situation, outcropping for twenty or thirty feet above its enclosing walls, and standing exposed for a thousand feet on the steep, granite face of the mountain, and the character of the ore, consisting of (1) a central column or crevice of white quartz crystals, somewhat resembling California gold-quartz, containing visible free gold; (2) a narrow ore-column on each side of this, composed of black, soft rock, at first supposed to be *hornblende*, but proving, on analysis, to be a peculiar substance technically called *ripidolite*, and constituting by far the richest portion of the vein; and (3) an outer column, on each side, of gray quartz, not so rich in free gold, yet assaying from \$900 to \$1,200 per ton. The whole crevice was about two feet in width at discovery, the rich streaks of white quartz and *ripidolite* being but eight inches, and the gray quartz and other lean rock filling the rest of the crevice. A tunnel of eighty feet, driven in the face of the lode, has since developed a vein of three feet in width, with the rich streak varying from twelve to thirty inches.

Other lodes were discovered, and, in 1871, a

mining district was formed called "The Animas District," and, during that season prospectors multiplied, and a large number of lodes were located, mostly of silver. All of them were found from the visible out-croppings, which could be seen for miles cutting whole mountains in twain and standing exposed, like a rooster's comb, from ten to thirty feet above the surrounding rocks.

In 1872, prospecting continued, and numerous lodes were located.

Capital, however,—the indispensable means for the development of the mines—was discouraged from coming in, owing to the fact that nearly the whole of the mining region was in possession of the Ute tribe of Indians.

By the Treaty of 1868, the Ute Indians, numbering not more than four or five thousand souls, all told, were granted the exclusive use of all that portion of Southwestern Colorado lying west of the 107th meridian and south of 40° 15' north latitude. It gave to each redskin—brave, squaw, and papoose—of the tribe something over three thousand acres, including many fine agricultural and pastoral valleys and a very large extent of mountain country, already reputed to be rich in mineral deposits. As the excitement over new discoveries increased during 1871 and 1872, this Treaty became the subject of no small amount of criticism; and the remonstrances of the miners, who claimed the country by right of exploration and discovery, as well as those of the general public, grew so persistent that the authorities at Washington were compelled to give ear to them. The result was that, in 1872, a Commission was sent out to meet the leading chiefs of the tribe with a view to the re-cession of the mineral portion of their Reservation. Through the machinations of outside schemers and other causes which need not be detailed, this effort was a total failure, and, in February 1873 the War Department, at the particular request of the Department of the Interior, issued an order requiring all miners, prospectors, and others to remove from the Reservation by the first day of June of that year. The effect of this order, (which was issued in the interests of a Wall Street Ring, with a view ultimately to secure control of the en-

tire region, with all its mineral wealth) was to intensify the feeling against the existing treaty, and the authorities became convinced that it would be impossible for them to stay the onward march of civilization—"this deluge of men, rising unabatedly, and daily driven onward by the hand of God." Powerful influences were brought to bear, to the end that a new Commission might be appointed and a new Treaty secured. But both the War and Interior Departments declined to recall or modify the order, and as the time for its enforcement drew near—when, in fact, the first detachment of U. S. troops were halfway up the Rio Grande on their way to expel the miners—the President himself was appealed to, and promptly disposed of the entangling red-tape by suspending the order. A new Commission was sent out, and a new Treaty was satisfactorily accomplished. This Treaty opens to the pioneer and prospector one of the richest and most interesting portions of Colorado, comprising over three millions of acres. The reclaimed district includes within its boundaries all the territory lying north of a line extending from the 107th meridian westward, fifteen miles north from, and parallel with the southern boundary-line of the Territory, to within twenty miles of the western line of Colorado; thence north to a point ten miles north of the 38th parallel; thence east to the 107th meridian; thence south to the place of beginning. This is entirely satisfactory to both Indians and miners. It opens up to settlement and enterprise all the upper portions of the fertile and beautiful valleys of the Southern Slope, and secures all the mountainous portion of the former Reservation on which mineral deposits are likely to be found.

GEOGRAPHY, TOPOGRAPHY, ETC.

The "San Juan Country," as known to the mining world, includes several distinct districts, viz:

Las Animas District, situated on the upper waters of the Rio Animas, with Baker's Park as a center;

Lake District, situated on the Northern or Uncompahgre Slope; and

Summit District, situated on the Eastern, or Rio Grande Slope of the region.

The mountain ranges, as to general direction, are here considerably broken up and deflected. The main range—*Cordillera del Sierra Madre*—bends to the southwest from the foot of South Park, dividing the waters of the two great continental slopes. Crossing Saguache County, it swerves still more to the westward, until midway between the 107th and 108th meridians, it bifurcates, the main sweep bending to the southward, separating the head-waters of the Rio Animas and Rio Grande, and, bending again to the eastward, forms the San Juan range. The other spur extends in a southwesterly direction, terminating in the Sierra San Miguel and the Sierra la Plata. It is as though the great rocky backbone of the Continent had been, by some awful spasm of nature, bent upon itself until its monster contortions overlapped each other. This explains the unparalleled ruggedness of the region and the occurrence of so many slopes and counter slopes within a comparatively limited area.

The region is remarkable, not only in the topography of Colorado, but in that of the American Continent. Theoretically and in fact, it is the apex of North America. From it, as a center, the waters flow in all directions—north-west, north-east, east, south, and south-west. On its northern slope rises the Lake Fork of the Gunnison, running northwestwardly. To the westward of this, and running in the same direction, are the Uncompahgre, Dallas Fork, Unaweep, San Miguel, and Dolores, all tributaries of the Gunnison and Grand Rivers—two of the principal sources of the Great Colorado of the West, flowing into the Pacific Ocean. The Rio Grande Del Norte heads on its eastern rim, flowing easterly and southerly into the Gulf of Mexico. Its southern slope is drained by the San Juan, the Pedro, Los Pinos, Florida, Animas, La Plata, and Mancos, the five latter being tributaries of the San Juan proper, (hence the general name of the country), which at first flowing in a southerly direction, afterwards winds to the northwest, and empties into the Colorado.

Thus it will be seen that the region is a veritable continental summit. The streams, as a consequence, are all very rapid, and are frequently interrupted by cataracts of considerable height.

The surface of the country is pre-eminently and

intensely mountainous; in fact the parks, so-called, are nothing more than mountain valleys, here and there widened a little, as if by accident.

The abruptness of the mountains is the most remarkable feature. On every hand, sharply-outlined snow-peaks pierce the clouds. There is nothing tame in the landscape. Everything is acute, immediate, and immense;

—“Sierras and eternal tents of snow,
That flash o’er battlements of mountains.”

Baker’s Park consists of a widening of the valley of the Rio Animas, from the mouth of Eureka Gulch to the upper end of the Cañon of the Animas at the juncture of Mineral Creek, some six or eight miles below. It is nowhere more than two miles wide, yet it affords pasturage for hundreds of mules, burros, and other animals, taken in by the miners every season.

Animas Park is, in fact, a myth, the only foundation for it being a similar widening of the valley of the Animas below the cañon referred to. It begins about thirty or thirty-five miles below the mouth of Mineral Creek, and lies on either side of the stream for several miles down. This lower valley, lying as it does on the southern slope of the continent, and well down towards the 37th parallel, exhibits a climate strikingly in contrast with that of Baker’s Park, but thirty-five miles to the northward. In the latter, the altitude being so great, and the proximity of perpetual snow so immediate, there is frost nearly every night in the year, while in the lower valley Summer prevails until October, and there are seldom frosts of any account until November.

The lower valleys of all the tributaries to the San Juan are limited in extent of surface, but exceedingly fertile. The native grasses, wild rye, oats, barley, etc., grow in great luxuriance, and grapes, crab apples, wild cherries, and other wild fruits, are found in abundance. Artificial irrigation is entirely uncalled for.

The valleys of this southern slope, as already mentioned, consist of the Navajo, Nutria or San Juan proper, Pedro, Florida, Los Pinos, Animas, La Plata, and Mancos. Of the latter little is yet known. The upper portions of these valleys abound in excellent yellow pine timber. Timber

occurs on several of the mountain slopes in the vicinity of Baker's Park, but it is of lesser growth and consists wholly of spruce, fir, and aspen, (*populus tremuloides*). There is, however, an ample supply of timber for all mining purposes for years to come.

All the streams mentioned are full of the large salmon-trout common to the mountain streams and lakes of Colorado. No fish are found in the Animas as high up as Baker's Park, owing to the intervention of the falls already referred to. Unlimited water-power is supplied by all the streams.

Game is abundant in some parts of the district, and consists of every kind found in other parts of Colorado—from the savage grizzly bear to the dusky grouse. Mountain sheep and "black-tail" deer are found in abundance along the upper Rio Grande, by those who know how and where to look for them; grizzlies are rarely seen except by the expert hunter, while the brown or cinnamon and black bears are not at all uncommon.

GEOLOGY.

The prevailing country-rock is granite, and the formation remarkably steady. The upheaval has been quite uniform, and the mineral lodes are almost invariably vertical. The prevailing direction is north-east and south-west, but a considerable number of lodes lie in a direction almost at right angles with this.

The Mother Lode of the Animas District, already described, stretches from southeast to northwest.

The evidences indicate that here is the junction of two well-defined mineral belts, the one running north-east and south-west, being the Colorado Belt proper, having its northern extremity in the North Park or Wyoming Territory, and its southern extreme reaching to the Silver City region of New Mexico, and even to the City of Mexico and the Pacific coast; the other being the Utah Belt, extending from the Sierra Nevada to the Moreno mines and others in Eastern New Mexico. Whether this theory be strictly correct or not remains to be demonstrated by further investigation. Certain English geologists, who made an examination of this country some years since, predicted that two

such belts existed, that their junction must occur somewhere in Colorado, probably within two hundred and fifty miles from Denver, and that, when found, it would exceed in richness anything yet discovered on the Continent. In the light of discoveries already made in the San Juan region their prediction would seem to have been verified.

The mountains in the vicinity of Baker's Park and the upper Animas, are more abrupt than in any other portion of Colorado, if not of the whole Rocky chain. The upper valleys are consequently narrow and deeply inlaid with rocky debris from the mountain sides. Even if gulch gold existed in these stream-beds in paying quantities, it would be next to impossible to secure it except by extensive and costly works for hydraulic mining.

Nowhere else in Colorado are the evidences so complete and incontrovertible of the existence of true fissure veins; and these evidences are patent to the most casual observer. The mineral-bearing veins may be seen at a great distance, cutting the loftiest mountains in twain, and are easily traced for miles in the same direction without breach or variation, except as to width. The Mother Lode of the region was first discovered and located as the "Mountaineer" on Mountaineer Ridge. It has since been followed in both directions from that claim, until nearly eight miles of the vein have been traced on the surface of the mountain and duly claimed. It is exposed on the easterly side of Cunningham Gulch, near its head, and one claim is located on this side of that gulch. How much farther it extends into Galena Mountain in this direction is not known. Crossing the gulch it continues steadily toward the south-west through the entire length of Mountaineer Ridge, some three and a half miles, to the head of Arastra Gulch, crosses that gulch and cuts Hazleton Mountain clear through to the Animas, which it crosses, appearing again on the opposite side at Cement Creek. Doubtless more careful research will succeed in tracing it much farther in both directions.

The vein matter consists of argentiferous galena, both coarse and fine, zinc-blende, gray cop-

per, pyrites of iron and copper, white and gray quartz, fluor spar, micaceous iron, etc. In the same vein the material is comparatively uniform, great variety, however, existing in different lodes.

The formation in the vicinity of Baker's Park is unusually uniform, varying chiefly in color, according to the predominance of this or that mineral element.

The entire region is a study for geologists, and a thorough investigation of its features cannot fail to prove of great interest to the whole scientific world.

In the lower valleys and along the foot-hills of the southern slope are extensive coal deposits with accompanying beds of fire-clay. Here will be established the reduction works required by the Animas District. The formations of this region, however, have not yet been sufficiently observed to be described with any degree of accuracy.

THE MINES.

Some mention of particular lodes, as illustrations of the characteristics of the mines of the region, will not be out of place.

The following examples are selected from the Animas District, not because they are better than those of others not mentioned, but because more accurate data concerning them is at hand, which cannot be said of the others.

The only lode yet practically worked to any extent is the Little Giant gold lode, in Las Animas district, of which some particulars have already been given. Assays have been made from the rich streak in the centre of the vein, which showed the enormous yield of \$31,116 per ton of 2,000 lbs, and the poorest selections from it yield from \$1,000 upwards.

The following is an exhibit of the several tests made with ore from the Little Giant:

No. 1,	1 cord 1st class ore, yielded gold, -	\$1910.00
No. 2,	$\frac{3}{4}$ " 2nd " " -	946.00
No. 3,	$2\frac{1}{2}$ " 3d " " -	908.00
No. 4,	$\frac{2}{3}$ " 1st " " -	1011.00
No. 5,	$2\frac{1}{4}$ " 2nd " " -	2950.00
No. 6,	$1\frac{1}{2}$ " 1st " " -	2242.02
No. 7,	$2\frac{1}{2}$ " 3d " " -	809.00
12 5-12 cords -		\$10776.02

First-class ore, averaging per cord -	\$1797.60
Second-class ore, " -	1298.64
Third-class ore, " -	330.16

The tailings of all the above, mixed, yielded by assay test nearly \$25 per cord, showing that the processes used were very wasteful. The gold from this mine is unusually clean, rating at 945 fine at the Mint.

In the spring of 1873, the Little Giant was purchased by a Chicago company. It has a small Dodge mill, with a light ten-horse power engine. A new fifteen stamp mill is now on the ground, and will be set up early in the coming season, when this remarkable mine will be more thoroughly tested. From the mine to the mill-site a wire tramway, 2,000 feet in length, has been constructed, which will have an average carrying capacity of thirty tons per day.

The lode is exposed for nearly its entire length, and no shafts are necessary. It is worked wholly by adits, and it will be years before it will be necessary to sink on the lode.

The silver lodes of the Las Animas District are its leading feature. Those consisting chiefly of galena are of comparatively low grade, assaying (from the surface samples, none of them having been penetrated beyond a few feet) all the way from \$1.50 to \$250 per ton. Those lodes containing gray copper (ant. sulph. copper), of which there are some forty or fifty now recorded, are much richer, assaying, from the very surface, from \$250 to \$5000 per ton. In some of the gray copper lodes, that metal—which is but another name for the miner's "brittle silver"—is confined to a narrow streak, varying from four to ten inches; in others it is scattered pretty uniformly throughout the entire vein. This latter is more particularly true of those veins which consist largely of fluor-spar as a mineral matrix.

The principal claims located along the Mother Lode, which has been already described, are the Yrebeba, on the easterly side of Cunningham Gulch; then, crossing the gulch, come the Mohawk, Mountaineer, Woodchuck, North Star, Terrible, Tamaqua, Comstock No. 3, Comstock No. 2, and Mother Comstock. The latter touches Arastra Gulch; crossing this gulch there are the Gray Eagle, Buckeye, Silver Star, Western Star, and Ajax, cutting through Hazleton

Mountain. Crossing the Animas, several other claims have been located, the names of which are not at hand.

As samples of some of the leading silver lodes, we may note the following:

The Mountaineer has a crevice from four to seven feet wide, filled with quartz, argentiferous galena, and gray copper, which, throughout the full width of the crevice, will average a value of from \$150 to \$250 per ton.

The Sinaloa has a four-foot crevice: spar and gray copper, no galena; and assays from \$550 to \$1000 from the surface.

The War Eagle has a four-foot crevice; spar and gray copper, very little quartz; assays, from any part of the crevice, from \$450 to \$700 per ton from surface ore.

The Yrebeba has a three-foot crevice; spar, white quartz, argentiferous galena, and gray copper; assays, from average of whole crevice, surface samples, from \$350 to \$1000 per ton.

The I. X. L. has a six-foot crevice; two feet of nearly clear gray copper; assays, from surface, from \$700 to \$5,000 per ton.

Summit District,—lying between the headwaters of the South Fork of the Rio Grande Del Norte and Los Pinos Creek,—has not yet been very fully prospected, but promises to become as noted for gold mines as the Las Animas District is for silver. The Little Annie lode, discovered in the autumn of 1873, shows specimens of fabulously rich quartz, and, we understand, has been sold for half-a-million dollars. Other lodes of gold have been located in its vicinity, and another season will probably demonstrate the extent of the deposit.

In Lake District, there has been comparatively little excitement, although, as in the Las Animas District, the lodes outcrop extensively, and some of them yield very rich samples of silver ore. Some of the principal lodes of this district are the Scotland, Major, Ute, and May.

PLACERS.

The name of the Rio La Plata (Silver River) seems to be a misnomer, for the prospectors who have already flooded the lower valleys—since the success of the New Treaty—have demonstrated that, along its shores, the golden dreams of the

unfortunate Baker Party are yet likely to be realized.

An old bed of the stream has been tested and found to yield at the rate of four dollars per day to the man by the old-fashioned rocker process. This patch is reported to be from twenty to thirty-five feet deep, to bed-rock, about three-quarters of a mile wide, and several miles long, and yields at the above rate from the very grass-roots—using a miner's phrase. Several gold lodes, of very promising character, have been discovered higher up in the Cañon of the same stream, which would account for the existence of placer diggings below.

If reports be true, here is to be the center of the next popular rush, for here is the poor man's Eldorado. Lode mining is the work of the capitalist and requires time; placer mines pay at once or not at all, and require but little capital. Given a pick, a pan, a shovel, and a sack of provisions, and there are no worlds the placer-miner cannot conquer.

AGRICULTURAL.

The valley of the Rio Grande del Norte, for sixty or seventy miles below its head, is adapted only to grazing and the raising of the hardier cereals and vegetables. Several stock men are already occupying it with their herds, but there is room for more.

The valleys of Lake District, though not extensive, are very desirable, and as yet almost entirely unoccupied.

The valleys of the southern or San Juan slope are the most desirable of all for purposes of agriculture. The choicest locations are fast being claimed, but will undoubtedly change hands once or twice before finding permanent claimants or cultivators. The first settlers of new mining sections are invariably transient, yielding to every wind of excitement. Hence the actual future owners of the larger portion of all these valleys have yet to see them.

There is room for a considerable farming population, outside the ready-made claims already secured, and the inducements to such are even stronger than to the average miner, since a market—which will be practically and forever without competition—is right at hand.

TOWNS.

The only towns of any size yet in existence in the vicinity of the San Juan Country are Del Norte and La Loma, and these are distant from thirty-five to ninety-five miles from the mines.

Del Norte is situated on the west bank of the Rio Grande del Norte, about ninety miles from its source and a few miles below where the river leaves its cañon and emerges into the San Luis Park or Valley.

La Loma, its jealous rival, is on the opposite bank of the river.

These towns, as supply towns for the San Juan miners, have almost had their day, and will soon give way to others more favorably situated. The Summit District may find it convenient to patronize them to some extent, but even this district is too far away to depend upon them in the future. The other districts are still farther away.

A town-site has been laid out at the foot of Baker's Park, on a beautiful slope between Cement Creek on the northeast and Mineral Creek on the southwest. A name for it has not been definitely decided upon.

Another is to be laid out at the mouth of Cunningham Gulch, Baker's Park, in the Spring. This is really the most central and available point for a supply-town.

Two young cities are struggling for the ascendancy in the lower valley of the Animas, viz: Elbert, at the old site of Animas City, and Hermosa (Beautiful) a mile and a half below, and on the other side of the river. The latter is said to have some advantage in the way of suitable ground and beautiful surroundings. It remains to be seen which will yield, or whether both will succeed.

A new town, named San Juan City, has been laid out in Antelope Park, on Clear Creek, near its confluence with the Rio Grande. This is a romantic spot for a Summer site, but the elevation—nearly nine thousand feet above sea level,—and the fact that for several months in the year intervening ranges will effectually isolate it from the mines it is designed to foster, will prove drawbacks to its very rapid or permanent advancement.

ROUTES.

There are at present two routes to the mines—one *via* Del Norte, and one *via* Conejos.

The direct route from Del Norte is up the Rio Grande to its head, across the main range of the Rocky Mountains, or Sierra Madre, to the head of Cunningham Gulch, and down that gulch to the Animas and Baker's Park. Distance 90 to 95 miles.

The indirect route is *via* Conejos southward to Tierra Amarilla in New Mexico, doubling the San Juan Range, and reaching the Lower Animas valley by a fair wagon-road; thence up the Animas to the mouth of Cascade Creek, up this stream to its head, and across the main East and West Range to the head of Mineral Creek, or one of its tributaries, and down the latter to its mouth at the foot of Baker's Park.

ALTITUDES.

The altitude of Del Norte is 7,550 feet. Following up the River, sixteen miles to South Fork, the barometer marks 7,875 feet; thirty miles to Wagon Wheel Gap, 8,090 feet.

Clear Creek, 55 miles - 8,550 feet.

Head of Antelope Park, 60 miles - 8,620 "

Divide at head of Crooked Creek,

70 miles - 9,590 "

Mouth of Lost Trail Creek, 80 miles - 8,910 "

Mouth of Pole Creek, 88 miles - 10,130 "

[The distances given are from Del Norte.]

Timber Line, east side of range - 11,900 "

Summit of Cunningham Pass - 12,100 "

Summit of Strong Pass - 12,600 "

Timber-line, west slope - 11,700 "

Head of Cunningham - 10,500 "

Mouth of " - 9,500 "

Which is about the average of Baker's Park.

Little Giant Mill - 9,800 "

Little Giant Mine - 10,300 "

Head of the Animas - 11,500 "

Pass at head of Cascade Creek on

route south to lower valley - 11,400 "

No observations have been noted in the lower valley.

The summits of the highest Peaks bordering the Animas and Cunningham Gulch are 13,000 to 16,000 feet in height.

COLORADO FOR CONSUMPTIVES.

It has been said that at least a third of the population of Colorado is made up of "re-constructed invalids." The statement is not very far from the truth. Even of those who are actively engaged in business or professional life, a large proportion consists of men who came to the Territory in an invalid condition,—unfitted for work and almost unable to live. In some cases, a brief, in others a longer, residence has "re-constructed" them, so that they are now able to take their full share in the work of the world.

Most of these have been sufferers from affections of the throat and lungs—asthmatics and consumptives, and, in many instances, the improvement which they have experienced has been little short of marvelous, whether its rapidity or its degree be considered. Some, who have been carried on beds from the cars to the hotels, and whose condition might well have been regarded as hopeless, have, in a few short months, been able to take their place in the ranks of active men. In other cases, as we have said, a longer residence has been needed before much improvement has been noticeable, but of those who have come, afflicted with the diseases specified, comparatively few have been ultimately disappointed in their desires for relief.

Hence, it has come to pass that Colorado is rapidly being recognized as the last hope of that almost hopeless, but lamentably numerous, class of sufferers—Consumptives.

Physicians have not yet exactly defined the causes which give Colorado this character. It is probable that those causes are too complex and too much associated and inter-dependent, to be precisely laid down, but the suggestion of a few of them may be of interest.

Doubtless one of the most potent causes is the rarity of the atmosphere. The "Plains" portion of Colorado is from 4,000 to 6,000 feet, or about a mile, above the level of the sea. Consequently the air is much more rarefied than on ordinary levels. This promotes rapid respiration and circulation of the blood, and gives an impulse to the whole machinery of life. A recent

writer has said that "one of the curses of civilized life is the consummate stinginess with which most people breathe." Here, respiration *must* be rapid, and, as a consequence, all the vital faculties are aroused; body and mind both respond to the quickening influence.

Coupled with the lightness of the air, is its extreme dryness. The rainfall is far below the average, dews are comparatively rare, fogs almost unknown. Hence there is a total absence of miasmatic exhalations and of those irritating atmospheric influences which so often produce and aggravate disease.

Another great climatic advantage in Colorado is its bright and almost constant sunshine. There are few days on which open-air exercise may not be taken, and comparatively few on which invalids may not sit out in the sunshine without fear of harm. Three-fourths, at least, of the days are perfectly cloudless, inviting to the fullest enjoyment of the refreshing air. By its influence on the spirits, fine weather is full of benefit to the invalid; but, beyond that, it is well-known that the direct physical influence of sunshine is neither small nor unimportant.

The Scenery of the country doubtless contributes to its remedial effects. The beauty of the Mountains, ever-changing in their aspect, under the progress of the seasons and the constant variety of light and shade, affords a continual charm, leading the mind away from the gloomy and depressing thoughts which so generally accompany ill-health, and filling it with a new interest.

A further advantage which Colorado has to offer is an abundance of good food. The influences which we have already noted—the quickened respiration and circulation, the cheering influences of sunny skies and magnificent mountain-views,—speedily manifest their potency in improving the appetite, and enabling the patient to assimilate a considerable quantity of food. It is important that that food should be of good and nourishing quality. Consumption is, in reality, starvation; and, in attempts to cure it, the assimilation of nourishing food is one of the first objects to be promoted. Bread, the great staple, is in Colorado almost uniformly of good quality,

much better than the average in other parts of the world. Game and Butcher's meat, fed upon the peculiarly nutritious grasses of the region, are also of first-rate quality. There can be little doubt that the excellent quality of the food—both animal and vegetable—in Colorado, is, to some extent, due to mineral constituents absorbed from the soil. The soil is exceedingly rich in phosphates, which, it is well-known, possess valuable medicinal properties.

We submit these few "guesses at truth," by way of introduction to three or four excerpts from the testimony of Physicians who have recently given to the world their views on the advantages of Colorado for Consumptives, and the precautions which should be observed by such as seek to avail themselves of those advantages.

DR. JOSEPH PANCOAST, the eminent surgeon and physician of Philadelphia, and Professor of Jefferson University, who recently paid a brief visit to Colorado, says:

That in regard to the great questions which concern invalids—heat, cold, dryness, and humidity, and freedom of the air from every noxious quality—Colorado presents peculiar attractions, that can scarcely fail to make it one of the great Sanitaria of the North American Continent.

Its weather, which is more than ordinarily clear and serene, and its scenery unexampled almost for beauty and interest, invite the invalid to outdoor exertion, and its mineral springs, of various qualities, grateful to the taste, will be found very beneficial in well apportioned doses.

Colorado lies in the Northern Temperate Zone, which is deemed in all cases the most conducive to health and longevity. It is protected by its mountain ranges against the cold winds of the West, and by its continental slopes from the paludal fevers of the Mississippi Valley. If greater warmth is required in the Winter, the railroad, which extends southward, places it within easy reach of the invalid.

There is no climate that fulfills all that is wished for special invalids. Few are now willing to send consumptives to the variable Winter climate of Southern Europe, where there are

weekly alternations of hot winds from the South and frozen blasts from the mountain ranges of the North. The African climates are in many respects better, yet the extreme heat which characterizes them is prejudicial to consumptives, and Dr. Schrepp, of Alexandria, has shown us that Phthisis is a common disease in Cairo, causing about fourteen per cent. of the general mortality.

The great elevation, and consequent rarefaction of the atmosphere, in Colorado, with its Thermometric moderation in all Seasons, gives to that region an especial advantage as a general Sanitarium. Yet this, though found extremely beneficial in many forms of Asthma and in the early stages of Consumption, by expanding the lung cells, may be prejudicial when cavities have been already formed in the lungs, which require contraction of the parts for their relief. It would, therefore, be well for invalids who think of visiting Colorado to read the remarks of Dr. Bancroft, of Denver, which have been founded upon personal experience in that locality.

At a recent meeting of the Washtenaw County (Michigan) Medical Society, a letter on "Colorado as a Sanitarium" was read from Dr. CHEEVER, late lecturer on Materia Medica in the University of Michigan. The *Chicago Tribune* thus briefly sums up the letter:

The climate of Colorado will cure all forms of consumption, if resorted to in time, and with proper precautions; but the patient should go there as soon as possible after the disease appears. They should choose Northern or Southern Colorado according as they are better in a cold or in a warm climate; and they should not, after leaving the Missouri River, rush through with the fastest train, but go slowly, so as to become gradually acclimated. Consumptives should go prepared to stay several years, as a brief stay is worse than useless; and especially those who improve rapidly, and appear to get quite vigorous, should be careful not to leave until their cure is complete and certain. They should not begin to exercise until they are thoroughly rested from their journey, and then only moderately at first. More patients who go to Colorado lose their lives from over-exertion at first than any other cause. The invalid should stay away from the mountains for

the first few months, at least, and, indeed, the safer and better way is to establish their permanent residence at the foot of the mountains. In that way they may be comfortable all the year, by taking a trip into the mountains during the hottest part of the Summer. They should be in the open air as much as possible; and, as soon as they gain sufficient strength, the patients will accelerate their recovery by engaging in some light employment that will moderately exercise both body and mind.

Dr. BANCROFT's remarks, referred to by Dr. Pancoast, are as follows:

I believe that any person with a fair constitution, who settles in any portion of Colorado, stands a better chance of enjoying a healthful life, and of finally attaining the full period allotted to man—three score years and ten—than in any part of the Union.

To the young of consumptive families it offers special inducements, for here, many a brilliant and useful life, that might be lost in less strengthening climate before reaching the meridian of manhood, may be prolonged to a vigorous old age.

The class of invalids who may expect to receive benefit by a residence in Colorado are wide and varied. Those suffering from many of the disorders induced by derangement of the digestive organs, functional affections of the liver, and debility caused by over-exertion of either the physical or mental forces, in whom the heart is sound, are improved by even a short sojourn in this invigorating air. Those troubled with chronic laryngitis and bronchitis, are generally permanently relieved, while sufferers with asthma almost invariably experience an immediate and perfect cure, unless it is complicated with emphysema or organic disease of the heart, in which case improvement is slow and not complete. In the incipient stage of pulmonary consumption the effect of the climate is very marked in its tendency to relieve chronic inflammation, to arrest the deposit of tubercles, and to prevent the ulceration of matter already deposited. It also often permanently arrests the progress of the disease, after small cavities have been formed in the lungs, in cases where there is no hereditary ten-

dency to it. Even where this tendency does strongly exist, Colorado air may stay the course of the complaint for years, if it is sought in the very out-set of the disease.

The wheat of Colorado is not surpassed in quality by any raised in the United States; and cattle in huge herds wander over the hills and plains, finding rich sustenance all the year around in the prairie grass; therefore, breadstuffs and beef are good, plentiful, and cheap, which is an advantage to the country second only to its air, it being a known fact that in regions where abundance of good bread and beef, with all their rich blood-making qualities, are within the reach of every family, pulmonary consumption is rarely prevalent.

While earnestly recommending the curative powers of Colorado, I must strongly warn persons in the advanced stages of pulmonary consumption against venturing into the rare air of these elevated plains, because the necessity for increased action of the respiratory organs tends to hasten instead of retard a fatal termination. The same caution is applicable to any form of organic disease of the heart, excepting that induced by asthma.

At a meeting of the Colorado Medical Association last October, Dr. MASSEY read a lengthy paper on the "Relations of Colorado to Pulmonary Consumption," from which we make the following extracts:

The repute attained by Colorado for its influence in the relief or cure of various diseases, prominently consumption, had no inception, and has no existence connected with histologists, minute anatomists and experimentalists. In fact, physicians have had nothing to do with the manufacture of its sanitary renown. Springing from facts discerned by the afflicted and their friends, its therapeutics have a claim to that investigation which "is the only rational and proper one for the study of that or any other department of natural science." I shall dismiss the fortified foundation of this repute very briefly. Judgment as to its correctness stands confessed in the observation of every one in this hall, whether members of our Association or intelligent citizen-observers of our proceedings.

It marshals its revitalized witnesses on many squares of this city, and in every town and hamlet for two hundred miles of the eastern slope of the mountains. Elastic and ruddy health stamped upon features which told but a few months before the story of but the anticipation of the shroud and the grave—these are sponsors eloquent of *facts* about which there is no nutriment for a single parasite of doubt. When I am told the history of consumptives by themselves; when they repeat what their home-physicians have said—many of them among the most honored in the land; when the wasted frame, the hectic flush, the night-sweats, the hemorrhages, the diarrhoeas, the exacerbating fever; when these and the shapes of other familiars are rehabilitated before me in persons now of splendid health—my humble tribute must be at the service of the correctness of the sanitary fame of Colorado. That such a record has led to exaggerations, perversions, and consequent evil to many, are incidents for which the facts cannot be held responsible.

Among the earliest professional references that I have stumbled across in reference to the bearings of the physical eccentricities of this peculiar geographical and meteorological region upon consumption and congeneric affections, is that of Dr. Coolidge in his statistical report of the sickness and mortality of the United States Army, which I see quoted in Condie's edition of Watson of 1858. In that report, probably made some years previously, Dr. Coolidge suggestively remarks that "the climate of those broad and elevated table-lands which skirt the base of the Rocky Mountains on the east, is especially beneficial to persons suffering from pulmonary disease or with a scrofulous diathesis." "The reports from the line of posts stretching from the Upper Platte through New Mexico to the Rio Grande give a smaller proportion of cases of pulmonary disease than those of any other portion of the United States. The air in this region is almost devoid of moisture; the depressing heats of eastern summers are never felt." Among the conclusions of Dr. Coolidge are, that, "*temperature*, considered by itself, does not exert that marked, controlling influence upon phthisis which has been attributed to it;"

and that "the most important atmospheric condition for a consumptive is dryness!" There is much in this singularly terse description of the climate of Colorado which physicians will recognize as apposite to their professional requirements of to-day; and no representation of the exceptional climatic and material peculiarities of Colorado, can be more directly or conveniently approached or illustrated than through their observed relations to the very class of diseases above referred to.

It is no part of the proof of the benefits of Colorado to consumptives that they are regulated by the thermometer; and when Professor Bennett complains that his American patients will not stay still at Mentone, watching their symptoms and their thermometers, but will go off on excursions to Switzerland and France, the American expression of "how natural" explains the fact. And when that distinguished authority "ardently hopes" that "my American colleagues will find some locality in their mountain region, accessible to New York, for a cool summer residence, where the minimum in July and August would be between 50° and 60° Fah. and the maximum between 60° and 70°," it may not be courteous but it is necessary, from this "mountain region" perfectly "accessible 'by rail' to New York" and yet two thousand miles away, to decline the commission. While there are hundreds of living facts demonstrative of the curability of phthisis in Colorado there are *none* to prove that those cures have been effected by any thermometric boundaries. Often up in the nineties, it is difficult to find any one who thinks that it is hot; down to zero occasionally, the fact is not appreciated sufficiently to keep anybody within doors. The days of heat and the days of cold are limited to but one, two or three at a time; and when it is cold it is clear and dry; when warm it is not with a sweltering heat. If to stimulate the vital powers; to add tolerance and tone to digestion; to quicken the absorption of morbid deposits by the circulation of blood renewed by new air; if these are among the requirements of hope in consumption—which all admit—I can imagine nothing more philosophically or therapeutically adverse to those essentials than thermometric confinement. The

adjuvants of cure in Colorado are distinctly those of nutriment; the outdoor inspiration of pure mountain, sunlit air, depurating the vital current and stimulating the organs of primary digestion to receive and dispose of the nutritious animal food of the mountain ranges. "If patients," says Professor Bennet, "can be brought to eat, to digest and assimilate, they have a chance of recovery. If they cannot their chance is indeed slight."

With an atmosphere clear, dry, cheerful, electric, Colorado has an average of three hundred and twenty-four bright, beaming, illuminated mornings, inviting to early rambles and a hearty breakfast. This average is thus reduced because every fifth or sixth winter is longer than the balance. There are scarcely a dozen days in any year that forbid morning and afternoon strolls or drives. The bearings of such a statement must address themselves to the profession. If we choose to skip from morning to bed-time, we find every night, during all the round year, pledged to cool and blanketed slumber. If it is preferred to linger with the day, there is an emotional scenery with which the eye never tires; there are rides and drives on roads solid and dustless, of undulations and pictures; there are points of interest to visit by rail from a few to a thousand miles; there are different elevations, accessible in a few minutes or a few hours, one more suitable than another for a residence of days or weeks for special indications. There are birds and fowl, deer, antelope, bear and buffalo to hunt and to eat; and there is "the milk of animals which pasture in the mountains" the dietetic importance of which is so eloquently alluded to by Niemeyer. Away above every vestige of "malaria," animal and vegetable decomposition is slow, and the sense is unfretted by a single one of those thousand smells for which the city of Cologne is famed. "Bedsores" are unknown in Colorado, the exhilarating climate opposing long confinement to bed. Wounds and surgical operations heal kindly, suppuration and ulceration being rare and limited.

I have often thought that our romantic electric demonstrations might have a magic or mysterious influence upon the consumptive, as they have upon the healthy. There is something

that makes nerve, muscle, blood and brain active and hopeful; that invokes the healthy to be superior to adversity and the invalid to be spirited to the last. No one can watch the panoramic tableaux of the lightnings of our spring months without delight and exhilaration; and I have sat at my office door for an hour or more in August, with consumptive men, as the sun declined beyond yon western range, watching the effect upon them of the varied display of flashes "as all along from peak to peak" they would pass or answer back; and have wondered if such an hour was not more beneficial than the most sensible advice or most benignant drug. Our rains come not down in drizzles, but in sheets. When it blows, we have a brief hurricane. When it thunders, it is with no voice of apology. It is hardly reasonable that such atmospheric phenomena should be without effect upon the spirits and bodies of men.

Even with the imperfect outline of Colorado peculiarities thus attempted, it is thought that sufficient has been indicated for the judgment of physicians as to what classes and what grades of invalids to commend to their influence, and what to withhold. As before intimated there is nothing like the mystery surrounding the hygienic powers of Colorado as there is about the action of our most valuable medicines; and yet, being potent, just as discreet and decisive management is required as in that of the most prominent and useful remedies to which we resort. Keeping pulmonary consumption still before us, as the most momentous, the most exaggerated type of disease for which Colorado has proved itself most benevolent and useful, it is as necessary to invest ourselves with its applicability to the cases committed to us as with that of any medical or surgical interposition in other physical misfortunes. If otherwise, the subject of our art may not only suffer, but that which is beneficent in itself may get a disrepute not deserved and thus shut off life to many who would otherwise woo and win it. Examples are familiar upon whose "through tickets" from St. Louis to Denver most opportune would have been the prophetic stamp of "it is too late!" It has happened that some have come but to meet death a little sooner than at home; and occasionally

death has claimed its victim even on the return cars, and again waited but for a few hours' reunion with family. Marvellous would it have been had there been no such cases, illustrative at once of the positive qualities of Colorado's atmospheric peculiarities and the vague and irresponsible information about them. The rapid transit to Denver with its rarefied air, as represented by five and a half thousand feet of altitude above what lungs have been raised to breathe, is often a successful venture with asthmatics; to get here safely and be quiet for awhile is the only sound starting-point for the consumptive. And yet, without advice and without judgment, some, after not receiving the same benefit from each inspiration that was expected at home from each tablespoonful of patent medicine, hurry off to points five thousand feet higher, as if thinking to jerk themselves into health. Whereas, if a year, with all its round seasons—and the winter months are generally considered even more favorable, as far as mere climatic effect is concerned, than even the summer, which has its sportive advantages, however—if a year's residence gives reasonable assurance of re-established health to him upon whom consumption has been fastened for say a year or more, most heartfelt should be his self-congratulation. In some cases these responsible assurances are reached in but three or four months; but these are exceptions, and generally represented in cases of accidental consumption, of not long standing, and in constitutions of the young and spirited.

While some cases, braced and stimulated from the first, by care and prudence, never recede, but go on gradually to re-established health, it is of experience that the large majority of consumptives, whether in what are stethoscopically known as the second or third stages, after a brief improvement, quite suddenly get worse, weaker, and of course dispirited. This—the natural exhaustion after stimulation—is the critical period for patient and physician; and its duration is irregular. Of this class are those who, becoming hopeless themselves, and their physicians discouraged, leave for the chances of home again; while others who, from poverty, pertinacity, or prudence of the physician and

because of the very repose necessitated, begin safely the upward turn toward health.

The very first, prime, leading indication, then, in the case of consumptives arriving in Colorado, is, that for weeks, they shall be kept RESTFUL, comfortable, and happy! It is a strain sufficient upon the vital powers to adapt themselves, with the utmost composure, to an atmosphere so rarefied and so rapidly reached; and it is as difficult as important to restrain the ardor of the newly-arrived from basking, with too much exercise, in a sunlit atmosphere so novel, illumined, champagne. To "pitch in," American-like, is a constitutional extravagance not tolerated to consumptives by Colorado. And yet, when, after watching, coaxing, and administering, not only the climate but the medication required, as physical tolerance and strength progress, the amount of fatigue and exposure upon which a patient flourishes is often surprising. A young man, doomed to die on every scientific principle, ten months ago, asked me in August why it was that he could lie out in the rain on the mountains every night, and get up soaked but hungry for breakfast every morning. It is therefore at least suggestible, that, in commending patients to Colorado, it may be more important to consult the constitutional impression, the powers of endurance and recuperation still left, rather than the mapped stethoscopic divisions of pulmonary consumption.

It is a grave mistake for patients to come to Colorado in search of health, with pockets lined with medical prescriptions from home-physicians for their own judgment in application. The physicians resident are just as cultivated and reliable as if they had never left the east! It is doubtless a graver mistake to "throw physic to the dogs" with an insensate determination to trust everything to Colorado weather or to hope for nothing. To assist the beneficence of the atmospheric abundance, it is not unreasonable that the system should be aided as much as possible for the reception of its benefits.

The fever of phthisis, with its morning remissions and evening exacerbations—so destructive of strength, of tissue, and of weight, I cannot regard as pathognomonic of the disease, as Nie-

meyer does. Even with their very "fits of shivering which come on, sometimes actually amounting to rigors," these come under natural laws, not specific. They present no different characteristics from fevers attendant upon pelvic or femoral abscess; from those of phlegmonous inflammation anywhere; from those of purulent absorption from wounds or amputations. The significance of fevers in consumption is magnified only by their protracted recurrence and the importance of the organs involved. Nor can I think "confinement in bed" the most appropriate therapeutics; but with nourishing diet and gentle stimulants during the morning remissions—with quinine and digitalis if necessary—the fanning of an afternoon Colorado drive and a temperate bath on return, every day—these are the remedies addressing themselves to the in-

stincts of the patient and the experience of the physician.

The free and frequent use of baths is not only indicated by the immense importance of attention to the functions of the skin; by an altitude unfavorable to insensible transpiration, and where sensible perspiration is rarely felt even in the hottest days of our summers; but by the suggestiveness of nature itself in its exquisite provision for their enjoyments and benefits, in the chrystal offerings by Colorado of its medicated springs, picturesque lakes, and its rivulets as pure as the mountain-snow which feeds them. All over the Territory, at from four to ten thousand feet above the level of the sea, at points accessible and provided with appropriate accommodations, are flowing waters of health—springs hot and cold, saline and alkaline, chalybeate and sulphurous.

THEN AND NOW.*

Twenty years ago there fell into my hands a volume entitled "*Report of the Exploring Expedition to the Rocky Mountains, in the year 1842. —By Brevet Captain J. C. Fremont, of the Topographical Engineers.*" This volume, though somewhat unwieldy in form, and overweighted with scientific terms, had for me all the charm of a wild romance—strange and stirring, and most improbable—and this young adventurer, Brevet Captain J. C. Fremont, of the Topographical Engineers, became a first-class hero in my eyes. A sense of awful remoteness invested the scenes he described as most beautiful and picturesque with a sort of unearthly solemnity. The nomadic beings he now and then encountered, in the mountains and on the plains, seemed to me not only out of civilization, but out of humanity—strange, unreal, uncanny creatures—solitary, sinister, and terrible.

I cannot remember that in my wildest dream I ever pictured myself as following in the footsteps of the brave young "Pathfinder"—as ever looking with my own eyes on the wonders of the great central height and grand western slope of

the continent. The vast region seemed still curtained away from me by infinite distance and mystery. Captain Fremont's book—it lies before me now—is illustrated with lithographs, rough, but truthful. When he comes to the march from the Arkansas to the Platte, along the eastern base or spurs of the great range, he gives a really fine view of Pike's Peak—the mountain of mountains for situation—lordling it over a vast, magnificent area. On July 8th he says: "We caught this morning a view of Pike's Peak, but it appeared for a moment only, as clouds rose early over the mountains, and shrouded them in mist and rain all day." July 10th presents another picture: "Snow fell heavily on the mountains during the night, and Pike's Peak this morning is luminous and grand."

One day the entire party had a buffalo hunt; another day an Indian fight; on July 11th they killed a large grizzly bear. They subsisted chiefly on game; and when buffalo, bear, deer, and mountain sheep failed them, they didn't despise the small prairie dog. For a time, attached to this party was Kit Carson—prince of guides and mountaineers—a noble son of nature, whose pat-

*Introduction to "SUMMER ETCHINGS IN COLORADO," by Ella Greatorck. New York, G. P. Putnam & Sons.

tern no longer exists. They found Indians, unhappily, more abundant than game; Sioux, Arapahoes, Cheyennes, Osages, Utes, and Pawnees, made that region their war ground. Yet, overswept as it was by surge after surge of barbarism, Captain Fremont, with the eye of a prophet, saw in it a country "admirably adapted to agricultural purposes, and capable of supporting a large pastoral population."

On the 17th, he entered the valley of the rapid, and always beautiful stream, called by the old French *voyageurs*, *La Fontaine qui Bouille*, from one of the many mineral springs on its banks. These waters were even then celebrated, and Fremont determined to seek them out. Leaving his men at the entrance of the cañon, he rode up the river, though, as he says, "the clouds, which had been gathering all the afternoon in the mountains, began to roll down their sides, and a storm so violent burst upon me, that it appeared I had entered the store-house of the thunder-storms. About sunset, I came upon a large, smooth rock, where the water from several springs was bubbling up, in the midst of a white incrustation, with which it had covered a portion of the rock. As this did not correspond with the description given me by the hunters, of the Great Spring, I did not stop to taste the waters, but, dismounting, walked a little way further up the stream, and, passing through a narrow thicket, stepped directly on a large, flat rock, in the upper part of which, apparently formed by deposition, was a beautiful white basin, overhung by wild currant-bushes. In this the cold, clear water bubbled up, kept in constant motion by the escaping gas, and overflowing the rock, which it had covered with a crust of glistening white. A deer, which had been drinking at the spring, was startled by my approach, and, leaping across the river, bounded off up the mountain. I had all day refrained from drinking, and now lay down beside the basin and drank heartily of the delightful water." The next morning the command encamped at the springs, and "spent a very pleasant day," drinking their fill. Fremont speaks enthusiastically of the rare beauty of the spot: "At the foot of lofty mountains, which sweep closely around, shutting up the valley in a kind of cove."

From the windows of the principal hotel of *Manitou*, the most fashionable and delightful watering-place of Colorado, I look out this Summer afternoon on the scene of Brevet Captain Fremont's lonely evening ride of thirty years ago. How changed, and yet unchanged, the lovely valley of the Fountain and its grand surroundings! Nature holds her own wonderfully. Old Pike's Peak presents the same majestic front, the river rushes and shoots along toward the thirsty plains, the ancient brotherhood of "Medicine Springs" still boil and bubble—"the store-house of the thunder-storms" is far from being exhausted. Almost every day there is fine artillery practice among the peaks and crags and gorges and "the big drops come dancing to the earth." Yet, in spite of thunder and rain, all is life and gayety in the little cove-like valley. There go a gallant, mounted party—not soldiers or mountaineers—but brave tourists, for the larger part ladies, galloping off over the Foot-Hills, to take the new trail to Pike's Peak—the very peak which Fremont seems not to have thought of scaling. You may visit the great *Manitou Spring* at any hour of the day, without starting a deer—that is, one of the wild, quadrupedal sort. From any one of the heights above the valley, you may look out on the plains all day long without beholding a buffalo herd careering along, with its valiant leader plunging ahead; but you may chance to see a train of Denver and Rio Grande Narrow Gauge cars, thundering along, after a sturdy snorting little locomotive, and making better than the best buffalo time. The noble savage—encounters with whom added such pleasing variety to Fremont's expedition, and in whose honor the party were gallantly accoutred, armed with Hall's carbines, and accompanied by a twelve-pound howitzer—he also has disappeared from the sacred waters he once haunted. His wigwam is pitched no more on the banks of the Fountain; but, instead, we see the tent of the artist and the jolly "camper." Should the mild and melancholy Ute, afflicted by some one of the ills that aboriginal flesh is heir to, visit the fount of healing opened in the rock for his pious sires, instead of the howitzer of the Pathfinder, he would be called upon to face the camera of the photographer. Even the grizzly has departed.

If you fancy you have lost a bear about that size, and go hunting him for days and days, he never turns up hereabouts. At Manitou we have a small infantine cinnamon, which we are obliged to content ourselves with; but he is sadly degenerate—having been brought up by hand, petted and spoiled by tender-hearted women. Indeed, so clever and moral is he, that we should hardly be surprised to hear any day of his picking out the Ten Commandments from a pile of Sunday-school cards, responding to the creed, and playing on the melodeon.

Could those brave explorers whose camp-fires lighted up the grand glooms of this lovely, lonely valley, and shone on these rushing waters, that balmy Summer night, thirty years ago, come back to the springs and banks of the Fountain to-day, would they like the picture? They would see hotels, cottages, bath-houses, summer-houses, bowling-alleys! They would see stage-coaches, ambulances, busses and barouches, horsemen and horsewomen dashing hither and thither. Saratoga trunks, pianos, and fiddles, have invaded the solemn scene. The inspiring war-whoop is silenced for ever, but the Italian *bravura* wakes the grand old echoes of the gorge. The war-dance and the scalp-dance are seen no more, but the "Boston Dip" and the "New York Glide" can be beheld almost any night in the halls of Manitou.

So peaceful, proper, and comfortable is our life here, that some romantic and adventurous spirits, growing desperate, break with civilization and luxury here below, and follow Nature to her loftiest rocky fastnesses, clutching frantically at the rude fringe of her barbaric robe. In other words, they go "camping" afar, in the great mountain parks, beside the snow-fed rivers and the glacier-born lakes, nigh unto the cold, white summits, which are white and cold for ever. On such a bold quest after Nature and simplicity—the essence of life—the exaltation of beauty—grandeur that verges on the terrible—the fine terror that is lost in sublimity—went we with a great caravan of pilgrims, among whom was the artist whose masterly sketches will picture the story of our wanderings far better than words of mine can tell it. We found beauty indescribable—grandness unimaginable—delight uncom-

municable, everywhere; but nowhere the expected wildness, savageness, and desolation. We looked here and there, with a sort of fearful desire, for dangerous wild animals; but though we traversed vast natural parks, explored mighty cañons, and scaled great mountain heights, we were not gratified by even the sight of a coyote or brown bear's cub. Even man was tame. Not a Ute or an Arapaho crossed our path. Wherever was human life, we found the prosaic, pushing, pertinacious Caucasian. We ascended Mount Lincoln. Above timber-line we found miners working where it seemed that only eagles could cling, slowly cutting into the mountain's bare breast to get at his heart of gold—and at fourteen thousand feet were other miners, braining his bald old head for the treasures stored up there. High up where the clouds break and the eternal snows rest, men have broken the stone lids of God's mighty caskets, shutting over the precious secrets of creation; deep down in solemn, shadowy gorges, they unearth shining, golden grains, hidden in depths of darkness for centuries of centuries. The world is storming the Rocky Mountains. Like the great sea which once beat against their base, Civilization is surging around them—rushing through their wild passes, and now and then throwing a wave over their loftiest summits. They are not only a grand store-house of storms, and a treasure-house of incalculable wealth, but, what is better, they are to become, with their wonderful parks, their lakes, rivers, gorges, woods, and waterfalls, the great pleasure-ground of the world.

GRACE GREENWOOD.

FRUIT CULTURE IN COLORADO.—Mr. Harpin Davis, of Ralston Valley, has been devoting much time of late to experimental fruit culture. He informs us that he considers the time well spent, as the results have been gratifying in the extreme. Apples, pears, cherries and the small fruits do well. The peach, he considers a failure in Colorado. Strawberries grow by the car-load in favorable seasons. It has been his experience that "high lands" are preferable to "bottoms" for orchards. The better varieties of shade trees—poplar, ash, etc.—are very thrifty and rapid growers. Last year he had four acres of dahlias, and, in due time, will advertise bulbs for sale. His nursery stock is thrifty and of known varieties. Many of the farmers are evincing an interest in fruit and forest tree culture, induced by his success. Mr. J. W. Cook, of the same village, is also interested in fruit culture, and is meeting with deserved success.—*Golden Globe*.

IRRIGATING CANALS.

The "Great Trans-Missouri Irrigation Convention" has been followed by the conception of some gigantic schemes for the construction of Irrigating Canals, and it has been quite a common thing, during the last two or three months, to hear and read of proposed Ditches, hundreds of miles in length, and many tens of feet in width and depth, intended to turn the Great Plains into one vast wheat-field and to make the "American Desert" to blossom as the rose. This idea, indeed, has assumed such definite shape that the President even proposed, in his Message to Congress, that national aid should be afforded for the purpose of constructing a canal from the base of the Rocky Mountains to the Missouri,—a canal which, (taking into account its unavoidable sinuosities,) would probably be not less than 1100 miles in length.

It may not be out of place, therefore, to state two or three reasons, as concisely as possible, why the construction of long and large canals would be inexpedient.

A short consideration will show that where a great length of canal is undertaken, the cost of its construction must be very heavy in proportion to the area of land which it will carry water to cover. Take, for example, a canal five hundred miles long; assume that sufficient water can be turned into it to water one thousand square miles; this would make a strip of two miles wide along the whole length of the canal. Now it is plain that, in order to water the first mile of the strip, the water has to be carried no distance at all; but, in order to water the last mile of the strip, the water to be used upon it has to be carried four hundred and ninety-nine miles, and the capacity of the canal has to be enlarged for its entire length, in consequence. Leave the intermediate land out of the question, and it will be seen that in order to water the last mile of the strip, a canal has to be constructed four hundred and ninety-nine miles long, with capacity to carry sufficient water for two square miles. And when it has been constructed, it has to be kept in order and repair, entailing continual expense.

Given an amount of water sufficient to irrigate a

certain area of land, it is by far the most economical plan to have that area of land in the compactest form possible. Suppose, by way of example, that sufficient water is available for the irrigation of 25 square miles. If that area be in the form of a parallelogram, twenty-five miles long and one mile wide, the construction of a main ditch to supply it with water, will cost at least four times as much as if the area were arranged in a square—five miles long and five miles wide. In each case, 24 miles of canal would have to be constructed, but the average capacity per mile in the two cases would have to be as $13\frac{1}{2}$ is to rather less than 3. Put the two upon paper, note how much water *each mile* will have to carry, in each case, and you will arrive at this result.

A more important objection, however, to the construction of long canals, is their waste of water. The extra cost of construction may be borne at the outset, and the extra cost of maintenance be felt but little afterwards, but the waste of water will be constant and serious, and it behoves those who may undertake the distribution of this precious commodity to consider that fact. The construction of a larger ditch than is necessary, means the exposure of a larger surface of water to seepage and evaporation than is necessary. The loss in canals, from these causes, during the first two years, is astonishing; it is only by actual test that we are able to realize how great it is.

In eastern navigating canals, the provision to make good this waste, by feeders for the long levels, enters largely into the calculations of the engineers. The old Erie Canal, before its enlargement, was estimated to lose eight inches per day; that is to say, it required a volume of water, equal in area to the whole surface of the canal and eight inches deep, to compensate for the loss from filtration and evaporation alone. The Chesapeake and Ohio Canal loses six inches per day. The Pennsylvania Canals lose from six to eight inches. The English Canals, more carefully constructed, and in a more humid climate, lose from two to three inches per day. It

must be remembered that Navigating Canals are constructed, as a rule, with much greater care than Irrigating Canals, much labor being frequently expended in lining and puddling them. We should judge, therefore, from theory alone, that the loss of water in hastily-constructed Irrigating Canals, running, for the most part, through a porous soil and under an arid atmosphere, would be very serious, and a loss to be provided against as much as possible. We have seen captivating schemes for canals, which are to run from the Rocky Mountains, and to waste their surplus waters directly into the Mississippi and Missouri; but if the Platte and the Arkansas Rivers lose themselves within 50 to 100 miles from the Mountains, (as they both have been frequently known to do,) after running thousands of years in their own channels, what would they be likely to do, if taken from their present beds, and turned into new ones running over a thirsty country?

I subjoin the result of two calculations based upon actual observations of ditches in Colorado. The first calculation is based upon data furnished by observations of a canal belonging to the Union Colony (Greeley) in Northern Colorado. This canal had been built a year and a half when the measurements were made; it passes over an exceedingly favorable country. The second calculation is based upon data furnished by observations of the canal built by the Central Colorado Improvement Company, in Southern Colorado. The measurements of this canal were made four months after the water was let in. Unlike the Greeley canal, this passes over a rocky and otherwise unfavorable country for the first eight miles. These two canals, therefore, may be taken to show the extremes. The calculations have been made for a ditch of the following dimensions:—100 feet wide on bottom; 6 feet deep; slope of banks, 2 to 1; $1\frac{1}{2}$ feet grade per mile; velocity of current, 2.71 miles per hour; discharge per second, 2,674 cubic feet. Such a canal, if we accept our first example as a rule, would lose itself in 431 miles; if we accept our second example as a rule, it would lose itself in 192 miles; and this without a drop of water being taken out of it for irrigating or

any other purposes, the loss in the first case being .8 ft. per day, in the second case 1.8 ft. per day.

Here it may be convenient to add the result of one or two other calculations. A "miner's inch" of water is generally estimated as sufficient for an acre of ground. It is the quantity that will flow through an opening one inch square under a head of four and a half inches to the centre of opening. This will cover an acre of surface 843 feet deep in 150 days—that is, during the five months of the irrigating season. A canal, therefore, of the above named dimensions, after allowing for loss by seepage and evaporation, according to our first example, would furnish water for a strip of land 314 miles long and one mile wide.

I calculate that the Arkansas and the Platte with their several tributaries would fill four such ditches, during high water, but, of course, would water double the quantity of land if carried in shorter ditches. From this rough estimate, I consider the quantity of water in Colorado equal to about 2,000,000 acres.

Setting aside the considerations which have been urged above, let the enthusiastic promoters of big ditches, to run from the mountains to the Missouri, ask themselves what would be the effect upon Colorado Farmers if their grand schemes could be carried out. The Great Plains, which now stretch, arid and uncultivated, to the East, levy a considerable Protective Tariff (in the shape of freight charges) on all agricultural products which come in to compete with our own. Could the Plains be watered, this protective tariff would disappear, and the irrigating farmer be brought into close and unequal competition with the produce-poor farmer of Kansas. Surely, this would be a disadvantage dearly bought. A large part of the population of Colorado is composed of miners, working in the mountains, to bring forth their precious treasure, and population of other classes—the population which comes to engage in Commerce or Manufactures, or comes in search of health or pleasure—naturally settles along the base of the mountains and in their passes and parks. It scarcely needs an argument, therefore, to demonstrate that the farmers' grain fields should keep as close in to the mountains as possible.

E. S. NETTLETON, C. E.

MISCELLANEOUS SELECTIONS.

FROM PUEBLO TO TRINIDAD.—A trip from Pueblo to Trinidad, even at this season of the year, when the long slopes and wide basins are covered with dry, brown vegetation, instead of the gay green of summer, can but convince, even the most prejudiced mind, of the rare advantages possessed by this section of the country for the various pursuits by which working-men earn their bread. For stock-growing, the country is as if made to order. The range is unlimited, and water is in the streams that run parallel with each other at distances ranging from six to ten miles, and, besides these, there are innumerable basins, containing thousands of acres of good grazing land, and which encircle large ponds of pure water. In these may be seen the gentle heifer and much-cursed steer, standing knee-deep in water, and panting industriously, after they have fully gorged themselves with government grass. The country is not all up hill and down like the Pilgrim's Progress, nor is it flat like the government finances. It is a long panoramic picture of gentle slopes, smiling ponds, halibut brooks, and fat cattle. Never were cattle in better condition than the thousands that are now browsing over this part of the Territory. They are literally grunting with meat-market obesity, and, if they do not carry a dignified tail through the present frosts, it will not be for the want of a fair start with a full hide. Although stock men complain of a scarcity of grass, every one of them, with whom we have spoken on the subject, knows of some other range only a few leagues away, where grass and water are plenty, and to which they intend to take their stock in case of necessity. For farming, this land needs only the farmers. Nature has furnished everything else. The soil is rich, and the face of the country seems to have been shaped with a special view to convenient irrigation; and with the right kind of men at the plow it will produce as no other country, not even the rest of Colorado, produces. It does not need men who lack both mind and money; men who are slow, and poor as printers; nothing to eat, and no place to cook it; men who farm by hunting and freighting, allowing their claims to shift for themselves while the proprietors spend time which should be used for opening farms, in waiting for better luck, and cursing the country; but men with grit and greenbacks, the more of both the better; men who know how to farm and who have—not a fortune—but money enough, at least, to commence with. While it is perhaps true that poor men can do as well here as elsewhere, that is not the kind of men most needed in the development of any new country. Colorado is full of them now, and her greatest need is live men with money enough to assist them in the work necessary for the establishment, on a firm basis, of their chosen avocations, then the country will become prosperous and her people wealthy and independent.—*Colorado Chronicle*.

PROSPECTING.—It seems to have been the design of the Superior Wisdom to make all other created matter contribute to the pleasure and happiness of the superior terrestrial intelligence and masterpiece of creative workmanship.—Man. Certain conditions, the requirements of which are also conducive to his well-being, are imposed; paramount among these—labor. The richest treasures are buried deepest, and the wildest charms of radiant beauty are the most difficult to win. This incites action and begets energy and enterprise, the fruits of which are health, prosperity, and plenty. These are well illustrated in the subject under consideration—prospecting, or gold hunting—the means by which mining property is discovered. The

homes of the ores bearing precious metals are deep fissures in the primitive or secondary formations; their immediate surroundings, solid granite, or dense gneiss, or granitoid, or gneissoid rocks. The locations of these are in the deep ravines and rugged steep slopes of mountain ranges. The guide to mineral-bearing fissures or lodes is the "blossom rock," one of the numerous varieties of quartz which is always a portion of the contents of mineral-bearing veins in gold and silver districts. This quartz is porous, and stained reddish brown by the oxides of metals, mostly brown and red hematites, and when usually found by the prospector, is, like himself, a "traveler," and has in the interstices of its numerous cells what the prospector wants in his pockets—the precious metals. The first object of the prospector is to find this "blossom," the next, where it comes from. Both require much industry, patience, and perseverance, which are the characteristics of the experienced gold hunter. His outfit is a pick, pan, and shovel. The pick and shovel for their usual purposes, the pan to wash earth or decomposed crevice material, supposed to contain particles of gold dust. He is supplied with as much solid provisions as he can carry. Thus equipped, outwardly and inwardly, filled with hope and confidence, he starts out. His way is through dense forests, along the slopes of steep mountains, over rugged crags, and across towering ranges. He moves along with a slow, measured step, carefully scans all the ground within the range of his vision, turns over loose rocks, examines the beds of mountain torrents, and the crevices of rocky ledges. He notes the formations and outlines of mountains, peculiarities of the surface material and drift, and the character of the rocks over which he passes; in short, nothing escapes his educated vision. When a piece of "blossom rock" is found, it is carefully and skilfully examined. When its corners are rounded by contact, while in motion, with harder material, he knows it has traveled some distance, and the crevice from which it came is remote, perhaps high up on the mountain at whose base it had been found. When the corners are sharp, and the fracture, where it has been broken from the mass it originally formed a part of, is recent, he is satisfied its home is near by. In either case he makes diligent search for the crevice from which it came. Sometimes this is found readily, and in other cases his search is continued for days and weeks. Every inch of the ground or rocks for thousands of feet around is carefully and skilfully inspected. His labors end only with discovery or night, and he lies down where the latter overtakes him, with no covering save the canopy of the stars and moonlight, or cloud and night-darkened sky; his lullaby, the sighing of winds through mountain pines, or the roar of mountain cataracts. Unrelenting travel, which is extremely fatiguing at great elevations, insures sleep and golden-bued visions—the great fissure vein has been found, filled with precious nuggets; mountains recede; beautiful valleys appear; the kiss of love is on his cheek, and the loving arms of home are around him. At early dawn he awakes, partakes of a hearty meal, and the search is resumed. When the "blossom" is found in considerable quantities or ledges, he digs down in search of crevice material (decomposed quartz and minerals with metal ores,) and other evidences of a fissure in the country rock, with well defined walls. The earth and crevice material taken out is carefully inspected and washed, and the "color" sought. It requires much skillful labor and considerable expenditure of money to define this. What follows is practical mining.—*Colorado Gazetteer*.

WET MOUNTAIN VALLEY.—Forty miles south of Canon City lies this beautiful and splendid valley, which is thirty-five miles long and twelve miles wide. A large portion of the land is suitably adapted for agricultural purposes, especially along the many sparkling mountain streams that flow through this fertile region of country. Water is plentiful, and during the spring and summer seasons, farmers experience no inconvenience to irrigate their land. In certain localities, at the foot of the Snowy Range, there are farmers who never irrigate at all, and raise the best crops. We believe there is no better pasturing ground to be found anywhere in this Territory, for cattle and horses, than in Wet Mountain Valley. Here we saw herds after herds of Native and Texas cattle, feeding upon the succulent grasses. They were fat and sleek as moles—in the finest order for market. It was in June when we passed through the valley. A herd of horses, two hundred in number, owned by a Mr. Hudson, were noticed on the range. These horses looked well and comely. For stock, the range is unquestionably as good as a stock man could wish, both summer and winter. Quite a number of prominent stock men have thousands of head of cattle in this valley, who pronounce it the best and most agreeable pastoral range they could choose in the Territory. One of the leading enterprises to be seen in the valley, is a large and extensive cheese factory, which has been in operation for some time. The proprietor has six hundred cows, from which he manufactures cheese of the best quality and taste. It is meeting with deserved success and profitable remuneration. Several large bay ranches, with their "green fruit," are worth looking at. Those engaged in this pursuit realize a handsome income every year. A ready market is found any time for this stock "providence" at Canon City and Pueblo. Fifteen hundred tons are cut yearly. In regard to wheat, barley, rye, oats, etc., the finest crops are raised. This year is said to have been a fruitful one for that valley, and the settlers rejoice exultingly over their fruitful harvests. The crops in general are better than heretofore. Horticulture is receiving considerable attention, and a large number of trees have been set out which are in a healthy state of growth. Vines, too, adorn the gardens of thrifty farmers.

—*Colorado Agriculturist*—1873.

THE MOOSE MINES.—This is, without doubt, the largest and most valuable argentiferous deposit that has yet been found upon Mts. Bross or Lincoln. It is situated upon the north-eastern face of the former peak, at an elevation of about 1800 feet above the town of Dudley, and between twelve and thirteen thousand feet above the sea-level. The rock in which it is found is a light blue limestone, which crops out upon the slope of the mountain, dipping into it at an angle of nearly 15 degrees. The Moose is located about fifty feet from the upper edge of this stratum, and pitches into it at the same angle. The deposit can be traced distinctly along the face of the mountain for at least 350 feet, and probably 500 feet. The present workings of the mine, however, embrace a length along its outcroppings of about 300 feet, including three stopes or adits, three drifts and one shaft. The ore body varies in width from one to six feet, and is enclosed between walls of limestone, that, for the character of the deposit, are remarkably regular in course and dip. The main entrance to the mine is by an almost horizontal adit, that, at the close of August, had been driven 150 feet into the rock. This adit follows the dip of the ore for some distance, and then passes over it. At the end, a shaft sixty feet deep had been sunk, which is reported to have found the vein below. 75 feet from the entrance east and west drifts have been run, that are 160 and 135 feet long, respectively, in which it is said that ore has been found throughout their entire length. Nearer to the mouth, another drift fifty feet long, connects the main adit with the east-

ern adit, which is at present nearly eighty feet in length. Two hundred feet west of this, the third entrance has been commenced, which it is intended to drive in as far as either of the others. The walls and roofs of the drifts and levels of the Moose are always covered with frost and ice crystals, so that it is a difficult matter, often, to follow the course of the deposit, and until one is acquainted with the character and appearance of the ore, to decide as to which is rock and which is mineral. What will be the extent of this deposit it is impossible to say. Upon the surface its outlines are very distinct, and easily traced. In the workings it is claimed that ore in large bodies has been found at nearly every point. Wherever the vein, at the time of our visit, was exposed in section (which was generally not far from the surface) it showed a fine body of ore, at times solid, and again more or less decomposed. The mine, since its opening (last year), has produced in the neighborhood of \$200,000, and is yielding at present as well as ever. The ore is of a high grade, averaging over \$200 per ton, and of a class that presents but few difficulties to the smelter.—*Mining Review* 1873.

WESTERN COLORADO.—The writer explored Western Colorado in the summers of 1864-5, as far as the Utah boundary and Green River, and, for farming and pastoral purposes, especially stock-growing, many portions surpass Eastern Colorado. After passing westward, through the great era of Middle Park, (which lies at the base of the Snowy Range, and which is capable of sustaining almost countless herds of cattle), and through Gore's Pass, the country opens out into numerous valleys, filled with the most luxuriant grass of the finest quality, abundance of timber, pine, spruce and fir, upon the divides, and in some cases a small growth of oak and deciduous trees. Wild fruits, game, and speckled trout, in abundance. Soil very rich, and in the valleys the sage brush becomes a miniature tree, eight to twelve feet high, and eight to ten inches in circumference. The valleys are caused by erosion here, and the scenery is of the wildest rugged character. Canons with perpendicular rock sides, two or three thousand feet in height. Down the Grand River, sixty miles below the Middle Park, occur boiling salt springs, from which salt enough could be manufactured to rival Salina or Syracuse. One hundred and twenty-five or thirty miles West of the Middle Park, and down White and Bear Rivers, we come to the Burnt Country or Desert, which extends West to the Utah boundary, and Green River, seventy to eighty miles in width, and from the Green River crossing of the U. P. Railway in the North, down the Green and Rio Colorado Rivers southward to Arizona, it is a veritable Sahara, except the valley courses of the White and Bear Rivers, which, like the Nile, form a continued oasis on their route. In the middle and Western part of the Desert occur the petroleum shales, with oily and bituminous matter oozing from them in such quantities that upon building a camp-fire it would ignite the rocky sides of the valley and send up a continuous jet of flames. There also occur strong vertical veins of pure Albertite coal, richer in quality than the Albert vein in Nova Scotia, heretofore considered the richest in the world. The veins are three to four feet in width; this coal, tested at Portland, Maine, gave 166 gallons of oil per ton. It is a great geological field; singular fossils and petrifications in abundance. Although the diamond fever was a swindle, there should certainly be diamonds and precious stones in this Desert in accordance with previous findings, of precious stones in other localities. There is also near here a strange weird section, called in the latest maps, Goblin City, where the red sandstone is thrown or worn into every conceivable shape; pyramids, sphinx, towers, domes, minarets, statues and rows of buildings represented for miles, a tenanted city of the dead, and no living thing to look upon, for the only animal that we saw was the lizard of the desert.—*P. H. Smart.*

HOW ARIZONA LOST HER FORESTS.—A legend of the Utes, for which I am indebted to the perusal of Major Powell's MS. notes, explains the cause of the absence of woods in Northern Arizona. It is not long, and there is something so inexpressibly novel in its movement, as well as in the fact of our drawing a new mythology and fresh imagery from the very heart of the continent, that I give it, as it is remembered. It is called "The Origin of Fire," and tells how once upon a time a bright spark fell from the point of a reed upon the ground, and the nightingale picked it up in its beak and found it was fire. And the mighty chief of the Utes asked what it was, and the nightingale said it was fire. And the mighty chief of the Utes asked if there were any more in the world, and the nightingale said that far off in the south was a people dancing ever about a great fire, with songs and shouts. So the mighty chief of the Utes made ready, and put on a fine cap, with eagle feathers in it, and started for the people of the south. And, as he went, he stationed nimble runners of his tribe all the way from the land of the Utes to the Fire People, at intervals of a mile. And, journeying, he came, after many days, to the Fire People, dancing with songs and shouts about a great fire. And he mingled with them, but they saw he was a stranger and looked askant at him. But he danced and sang and shouted with them, and suddenly stooping, thrust the end of his eagle plumes in the fire, and they blazed up mightily. And the Fire People would have caught him, but he leaped over their heads and ran to the first man of his tribe, and, falling exhausted, handed him the blazing plumes and told him to run. And he ran and fell exhausted by the second man, handing him the plumes. And so they ran, each man catching the fire plumes from the hand of the runner, until the last man brought it to the land of the Utes. And they were so rejoiced, they put the torch to the roots of a mighty tree on the edge of the forest, and shouted as it burned. But a great wind sprang up and carried the fire into the forest, and it spread in every direction, and all the woods were destroyed. And the people of the Utes prayed long and loud to the god Tawots, and at length he sent a mighty rain, which quenched the fire. But a turtle sat upon a spark of fire and kept it alive during the rain. And this was the origin of fire. The myths combined give a not uninteresting statement of the origin of the Grand Canon and river of the Colorado, and of the absence of forests in this part of Arizona.—*M. S. Severance in Old and New.*

THE BOYS.—Looking at these boys all over, they are far from being bad. There are a few who like fun and noise, and who would be led into all sorts of mischief if they were not restrained; but they are not going to run wild. They are getting tamed a good deal in school, and good influences are all the while surrounding them. Their teachers call them smart, which is a different verdict from what was given by our first teacher. These boys of ours have a great destiny. They are going to explore and ransack the mountains. As the boys of the east look at the blue ocean, and long to visit distant shores; so our boys look at the blue mountains, and long to visit the parks, and the distant Colorado river running in its gorge 3,000 feet below, and roam over the vast and plains of Arizona, stretching into Mexico and California, like another continent, and strewn with ruined cities, and evidences of a buried civilization; and amidst all are rich valleys, and dense forests, and mineral wealth untold; and thither, when a few more years are past, these boys, bronzed by the Colorado sun and wind, and with a complexion like that of Matthew, Mark, and Luke, and John, with their outfits of blankets and mules, they will go to wrest from nature her secrets and riches. As for the girls, they will go along; and so, as the case now stands, we cannot have too many of them.—*Greely Tribune.*

THE SWITZERLAND OF AMERICA.—Surely no American should be deficient in knowledge of his own country. The proverbial ignorance of foreigners in respect to this continent, and more particularly as to its geography, is measurably excusable. The country is new, and much of the information about it is recent; the ways of Europe are old, the channels of knowledge sluggish, and only here and there a man is found who keeps himself abreast with the news of the day. But no such excuses are admissible in the case of the American. He is expected, and he expects, to supplement the knowledge he obtained at school or college with continual accessions of general information. So far as these accessions should consist of new knowledge—of facts that the world did not previously possess, whether in the mere record of current events, or in any art or science; whether classed as matters of history or geography, or of literature or religion—he has the right to demand that he should be supplied with them, in greater or less fullness, according to their interest and value, by his daily newspaper. Our knowledge respecting many parts of this continent has been very largely enhanced within the last dozen years, this new information is finding its way into the text-books and will be taught to our children, or at all events to our grand-children. But meanwhile if, for instance, the average educated American were asked to give names, altitudes, and localities, of the half-dozen highest mountains in the United States, he would probably reply that he could answer that question as to Europe or even Asia or Africa more readily than as to his own country; unless, indeed, he had been a careful *Tribune* reader, and was familiar with the story of western explorations in 1873. The previous expeditions of the United States geological survey of the territories, under the management of Professor Hayden, had penetrated the wonder-land which has since been set apart by act of congress as the Yellowstone National Park. No description can do justice to that region, where nature has exhibited her most fantastic mood. The geysers, surpassing in grandeur those of Iceland, have an infinite variety; although so numerous that they have scarcely yet been counted, there are no two alike. The scenery is equally strange and varied, and there are many series of basins of graceful shapes, lined with brilliant yet delicate colors, filled with waters of every degree of temperature, from cold to boiling. Selecting that which suits him best, the bather plunges at will into some tepid basin, and those who have enjoyed this luxury, declare that there is a softness communicated to the skin by these pleasant baths which gives rise to the belief that there is a peculiar virtue in the waters. In short, it was a tale of fairy-land; and however delightful when first told, would not bear repeating too frequently. So for 1873 Professor Hayden gives us instead of the story of the Yellowstone, that of the Rocky mountains of Colorado. To the tourist who would contrast the wonders of foreign travel with those within our own shores, we could point to the grandeur of Niagara and Yosemite, and to the varied attractions of the Yellowstone park. But what had we to offer in comparison with Alpine adventure and the haughty crags of the Jungfrau and the Matterhorn? Even Agassiz speaks somewhat dolefully of the absence of glaciers in the mountains east of the Mississippi. But last year's explorations of Prof. Hayden have given us the land of snow and ice above the clouds in the mountains of Colorado. There are the glaciers, there are hundreds of mountain peaks difficult to climb; many of them have never been ascended, many of them have not even received a name. To the adventurous traveler to whom nothing is more distasteful than the beaten track, this new-found mountain land offers singular attractions.—*N. Y. Tribune.*

SUMMARY OF NEWS.

Denver-made crackers are achieving a great popularity in Kansas City.

Colorado has sixty-five flouring mills, turning out an annual product amounting to \$1,225,000.

The mills at Black Hawk and Central, custom and otherwise, are full of ore.

Pueblo votes for or against the issuing of \$350,000 in bonds to the Pueblo & Salt Lake Railway, on March 3d.

The editor of the *Mining Review* observes that the scale of prices for day labor is slowly but steadily falling in all the mining districts of Colorado.

The operating expenses of the Denver and Rio Grande Railway for 1873, were only forty-nine per cent. of the earnings.

A party of Englishmen are about to have Estes Park surveyed for settlement. They pronounce it the prettiest spot in the world.

The Denver and Rio Grande Railway run two freight trains daily to the Divide, and one to the end of the route. Eight trains pass over the road each day.

Plans are maturing for the erection at Littleton of a church edifice for the use of those who hold the views of the Reformed Episcopal Church. It is intended to be built during the coming Spring.

According to the *Golden Transcript* the business of the Colorado Central is steadily increasing, and the receipts from freight for January up to the 17th, exceeded those for the entire month of January, 1873.

A full and interesting report of the Hayden Explorations in Colorado last season has been issued in a New York *Tribune* extra, or supplement.

Granges continue to be organized in all parts of Colorado.

The Western Union Telegraph Company will change their line below Pueblo, so as to follow the Denver and Rio Grande route.

Preparations are being made to open some of the best mines in Gilpin County, which have not been worked for several years.

Placer diggings on the Platte, within four miles of Denver, are paying from three to five dollars in gold per day to the man.

A large number of California, Nevada, and Utah miners are preparing to enter the San Juan district, in South-western Colorado.

The bullion product of Clear Creek County for 1873 amounted to \$1,259,761.06. It is estimated that the yield for 1874 will reach \$2,000,000.

An act to incorporate the Colorado and New Mexico railroad company, and grant the right of way over the public lands is before Congress.

According to the census of 1870, Clear Creek County contained 1,596 inhabitants. It is estimated that it has now, says the Georgetown *Miner*, a population of 5,500, an increase of 3,904 in less than three years.

A pleasant contrast is that between the financial condition of the two Territories of Montana and Colorado. The debt of Montana is \$432,000 while the treasury of Colorado contains a balance of over \$18,000.

In his message to the Territorial Legislature, Governor Elbert gave the following statistics, as indicative of the progress and wealth of Colorado:—

Assessed value of property, 1873	\$5,000,000
Proper assessment, as per report of Auditor and Treasurer	50,000,000
Real value of property, as per reports of Auditor and Treasurer	70,000,000
Mining product, 1873	2,000,000
Coal " "	1,000,000
Agricultural " "	3,000,000
Stock sales " "	8,000,000
Lumber product " "	12,000,000 feet
Cattle in the Territory	400,000
Sheep " "	400,000
Horses and mules in the Territory	40,000

Miles of railroad completed and in operation in Colorado:

Kansas Pacific—Denver to Kansas State Line	180 miles
Arkansas Valley—Kit Carson to Las Animas	56 "
Denver Pacific—Denver to Territorial Line	57 "
Denver and Boulder Valley—Hughes to Boulder	57 "
Denver and Rio Grande—Denver via Pueblo to LaBran	135 "
Colorado Central—Denver via Golden to Black Hawk, Floyd Hill, and Longmont	90 "
Atchison, Topeka and Santa Fe—Kansas State Line to Granada	13 "
	694 "

Estimated cost of construction and equipment at an average of \$15,000 per mile, cash

Railroads in progress of construction, with length of line on each, which will probably be in operation in 1874:

Colorado Central—Longmont to Julesburg	175 miles
Colorado Central—Floyd Hill to Georgetown	56 "
Golden and South Platte—40 Aetna	50 "
Arkansas Valley—Las Animas to Pueblo	56 "
Denver and Rio Grande—Pueblo to Trinidad	50 "
Atchison, Topeka and Santa Fe—Granada to Trinidad	50 "
Denver, Santa Park and Pacific—Denver to Buffalo Creek	38 "
Denver, South Park and Pacific—Morris to Breckenridge	38 "

Estimated cost of construction and equipment, average of \$15,000 per mile.

Gross amount of earnings of railroads in the Territory for 1873

1873	\$4,200,000
Telegraphs in the Territory	1,057 miles
Telegraphs in the Territory, valuation	\$203,400
Irrigating canals in the Territory	450 miles
Irrigating canals in the Territory, valuation	\$400,000
Churches in the Territory	125
Churches in the Territory, valuation	\$450,000
Public schools	180
Value of school property	\$260,181.46
Increase of value of school property	100 per cent.
Value of reduction, uniting, and separating works in the Territory	\$2,000,000
Value of manufactures, including wooden mills, planing mills, paper mills, saw and door factories and car factories	\$735,000
Lands under cultivation	200,000 acres
Lands capable of irrigation and cultivation	2,000,000 to 5,000,000 acres

The grazing area covers 70,000,000 acres; while gold, silver, copper, lead, marble, gypsum, lime, petroleum, and mineral springs abound throughout an area of about 30,000 square miles, with iron and coal deposits equal to those of the States of Missouri and Pennsylvania.

Figures were also given showing the assessment of taxable property in each County for the years 1870-71-72-73. These showed an increase of 1871 over 1870, \$7,354,073.37; 1872 over 1871, \$7,147,178.93; 1873 over 1872, \$4,317,181.20. In the three years last past, taxable property has increased \$18,799,433.50, or, if the estimate of the Treasurer be taken, it has increased \$33,221,995. In that time the counties of Boulder, Bent, Jefferson, Larimer, Huerfano, and Las Animas, have nearly or quite doubled their wealth. The counties of Arapahoe, Weld, Douglas, Park, Fremont, and Saguache, have nearly or quite trebled their wealth. The counties of El Paso and Pueblo have nearly or quite quadrupled their wealth.

It is only a few years since Colorado was considered exclusively a gold-bearing country. Now the area of Territory productive of that metal is not over 350 square miles against 2,000 known to be rich in silver deposits.

At least twenty-five coal banks are open within one to three miles of Trinidad, all of which show a richness beyond all expectations.

A flouring mill to cost \$80,000 is being put up eight miles south of Denver.

The silver shipments through Denver have been averaging about \$30,000 per week for some time.

Sheep at \$1.25 apiece at Albuquerque, N. M.

The feasibility of establishing a butter and cheese factory on the lower St. Vrain, is being discussed among the dairymen.

The famous "Rough and Ready" Mills, at Littleton, have been totally destroyed by fire. The mills were worth \$32,000, and there was about \$30,000 worth of wheat in them at the time they were destroyed. It is about two years since the old mills, on the river, were burnt down. The fires in both cases are supposed to have been the work of incendiaries.

On January 31, the thermometer on Pike's Peak was 23° below zero. Assistant Observer Cramer went out on the morning of the 31 to repair the Peak wire. Sergeant Seyboth waited at the Summit station until 3 p. m., when he became alarmed at the long absence of Cramer, and then went out in search of him. He found him about a mile and a half from the summit in a fainting condition. His face was badly frozen, and his eyelids were actually frozen together. By the time Seyboth got him to the station on the summit, his own nose and ears were frozen. He immediately applied snow to the frozen parts, and succeeded in saving them.

The gold and silver product of the Territory for 1873, according to the *Denver News*, is \$34,183,360. The amount of exchange drawn by the three national banks of Denver aggregates \$22,250,000. The million shipments by express from Denver direct, estimating for December, were, gold, \$875,550; silver, \$184,110—being a total of \$1,059,660. The deposits at the United States Mint in that city during the year were: gold bullion, \$771,015.29; silver bullion, \$16,420.04. There were erected in Denver during 1873, 225 brick buildings, at a cost of \$667,100; and 423 frame buildings, at a cost of \$415,500. The trade of that city for 1873, amounted to \$14,323,800, and for 1872, \$13,090,000, showing an increase of \$1,284,800 in commercial transactions. The manufactures for 1873, amounted to \$3,249,100; and for 1872, \$1,394,000, showing an increase of \$1,855,100.

Dr. F. V. Hayden, United States Geologist, now in Washington, asks for an appropriation of \$75,000 to continue the geological survey of the territories. The work for the season of 1873, he says, was carried on in the mountainous portions of Colorado, and he desires, during the coming season, to survey the country westward toward the Green and Colorado rivers. He speaks of this region as one of the most interesting portions of the continent, containing the greatest continuous area of lofty peaks to be found anywhere in America. The general level of the country varies from 6,000 to 10,000 feet above the sea, and there are hundreds of peaks which rise to a height of from 12,000 to 14,000 feet. The rivers run in long, continuous canons, or gorges, which display sections of strata often a mile in thickness, with wonderful features, and in many instances the complete subversion of immense groups of beds without a parallel elsewhere on the continent.

Trinidad has now two banking houses.

The area of land known to be rich in coal deposits in Colorado is about 7,200 square miles, lying in various parts of the Territory, on both sides of the main range. There can hardly be a doubt but that this extent will be largely increased in coming years, for new discoveries are constantly being made upon the foot hills and plains.

The *Denver Tribune* says: A Denver correspondent has it from a gentleman high in official position in the Territory, that there is a certainty of the U. P. R. R. building from their junction with the Julesburg road, up the Cache la Poudre valley, through Fort Collins, and out to Laramie City.

The Conference of the Congregational Churches of Colorado have decided to establish a College, with classes for both sexes, at Colorado Springs, and a Board of Trustees has been appointed to carry out the plan. The Colorado Springs Company has given about 200 acres of very valuable land in aid of the enterprise, and several promises of liberal donations have already been received from various parts of the Territory, and from eastern friends. It is believed that the salubrity of the location and its other well-known attractions in the matter of scenery, etc., will cause the classes to be filled with students from all parts of the Union, almost as soon as they are opened.

The *Denver Times* says that about twenty-two miles up Cherry Creek an important discovery was made recently of the remains of a mastodon or of some other species of extinct animals allied to it. About a month since Mr. Manchester, who lives in the neighborhood, while walking along saw a huge bone projecting above ground. It proved to be a tooth of peculiar shape and enormous dimensions, being 7 3/4 inches long by 3 3/4 wide. By degrees he has unearthed portions of the skull and jaw-bones, two other teeth and two huge tusks. One of these tusks is broken off, but the portion which remains is five feet long, eight inches through at the large, and three inches through at the small end. Its extreme length, when perfect, must have been at least eight feet. The other tusk is a smaller one. The ivory itself is in poor preservation, and is broken in many pieces. Efforts will be made to fasten it together by some solution as it lies in the ground, and then take it up entire. As soon as the frost is out of the soil, further researches will be made, and the whole skeleton, if possible, secured.

ERRATA

IN ARTICLE UPON SAN JUAN.

P. 134, 2nd col., 5th line, read \$25 per ton, instead of "\$25 per cord."

P. 135, 1st col., 42nd line, read *Ulay*, instead of "May."

P. 136, 1st col., 33d line, read *four miles and a half*, instead of "a mile and a half."

P. 136, 2nd col., 33d line, read *Stony Pass*, instead of "Strong Pass."

P. 231.—GEOGRAPHY, TOPOGRAPHY, ETC.—Copper Mountain District has been organized since the article was prepared and in type. It covers the Placer Diggings, as well as the Copper and Gold discoveries, of the Rio de La Plata.



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